

CALIBRATION OF THE PCB  
WATER QUALITY MODEL FOR THE DELAWARE ESTUARY  
FOR PENTA-PCBs AND CARBON

**APPENDIX D**  
**MODEL CALIBRATION RESULTS:**  
**PLOTS OF NET SOLIDS BURIAL AND SPATIAL COMPARISONS WITH DATA**

# SHORT TERM SIMULATION RESULTS FOR DELAWARE RIVER ESTUARY

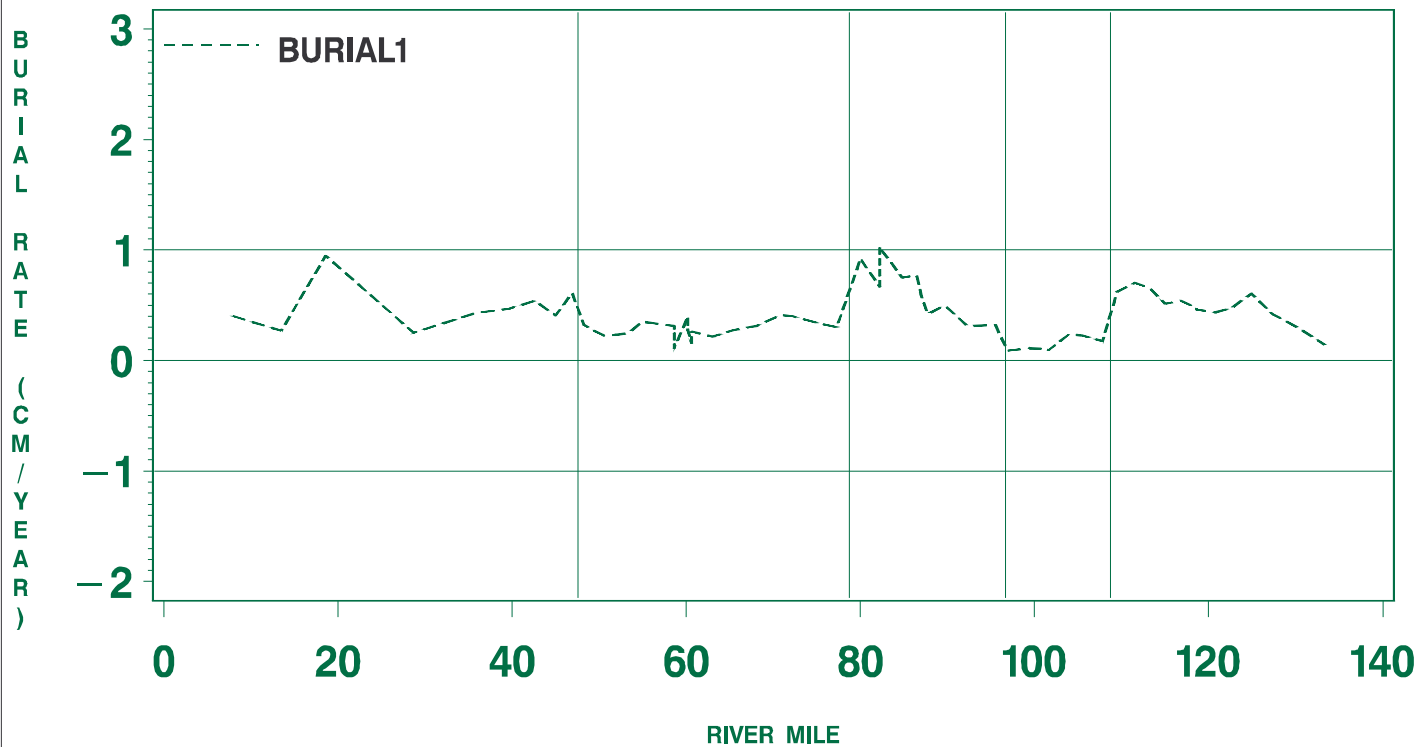
## BURIAL RATES AND SPATIAL PLOTS OF WATER COLUMN BIC, PDC, R1, AND PENTA PCBS

- DATE OF FILE CREATED: 01AUG03 15:18; FILE NUMBER CAL\_CARBON\_0100
- VR=RESUSPENSION RATE BETWEEN WATER COLUMN AND SURFACE SEDIMENT
- CONDITIONS1: VR= 0.10 CM/YR UPPER PART OF ZONE 2; 0.25 CM/YR LOWER PART OF ZONE 2
- CONDITIONS2: VR= 0.75 CM/YR ZONE 3; 0.50 CM/YR ZONE 4; 1.25 CM/YR ZONE 5
- CONDITIONS3: VR= 1.50 CM/YR MOST OF ZONE 6; 0.10 CM/YR ZONE 6 AT BOUNDARY
- PURPOSE: SPATIAL EXAMINATIONS OF WATER COLUMN BIC, PDC, AND PENTA PCBS ON DATES
- OF AMBIENT SURVEYS
- A LIST OF SURVEY DATES: 3-15-02, 4-11-02, 4-22-02, 5-06-02, 6-19-02
- A LIST OF SURVEY DATES: 8-05-02, 8-19-02, 9-03-02, 9-23-02, 10-08-02, 11-21-02
- A LIST OF SURVEY DATES: 3-10-03, 3-19-03
- SEDIMENT BURIAL TIME STEP: 73 DAYS

- INCLUDING NEWEST PENTA PCB DATA OF 7-23-03

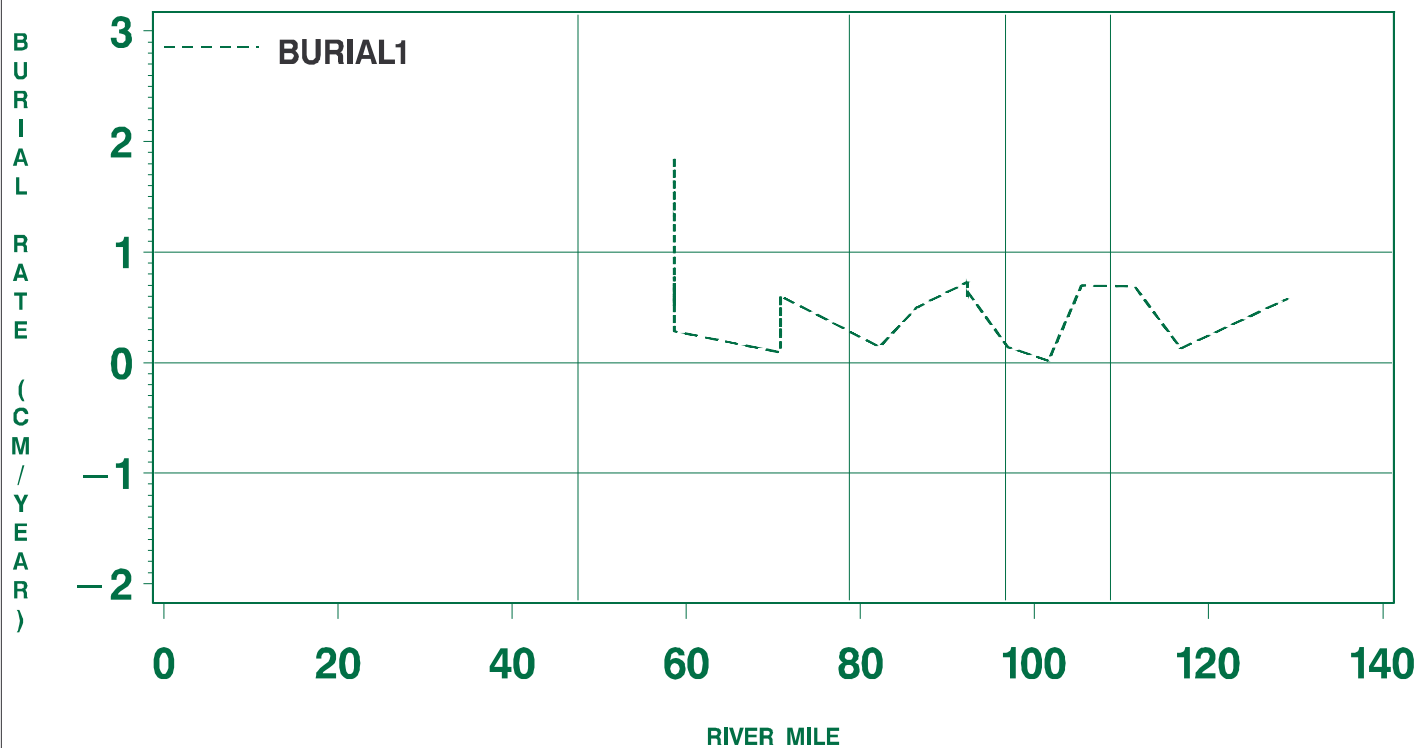
- INORGANIC SOLID: INITIAL CONCENTRATION VARYING BY SEGMENT; NO LOAD ASSIGNED
- BIC=BIOTIC ORGANIC CARBON, PDC=PARTICULATE DETRITAL CARBON
- POC=PARTICULATE ORGANIC CARBON
- C\_CL\_30: BIC CARBON TO CHLOROPHYL RATIO; RATIO OF 30 FOR DERIVING BIC AND PDC FROM POC
- C\_CL\_40: BIC CARBON TO CHLOROPHYL RATIO; RATIO OF 40 FOR DERIVING BIC AND PDC FROM POC
- C\_CL\_50: BIC CARBON TO CHLOROPHYL RATIO; RATIO OF 50 FOR DERIVING BIC AND PDC FROM POC
- DERIVED DATA:  $BIC = CHLOROPHYL * BIC \text{ CARBON TO CHLOROPHYL RATIO}$ ;  $PDC = POC - BIC$
- BIC SETTLING 0.1 M/DAY; PDC SETTLING 0.5 M/DAY
- RESULTS FOR PENTA PCBS WERE SOLELY BASED ON CARBON CALIBRATION
- NO REFINEMENT ON ANY PCB RELATED CONSTANTS AND COEFFICIENTS WERE PERFORMED

## BURIAL RATES FOR MAIN STEM



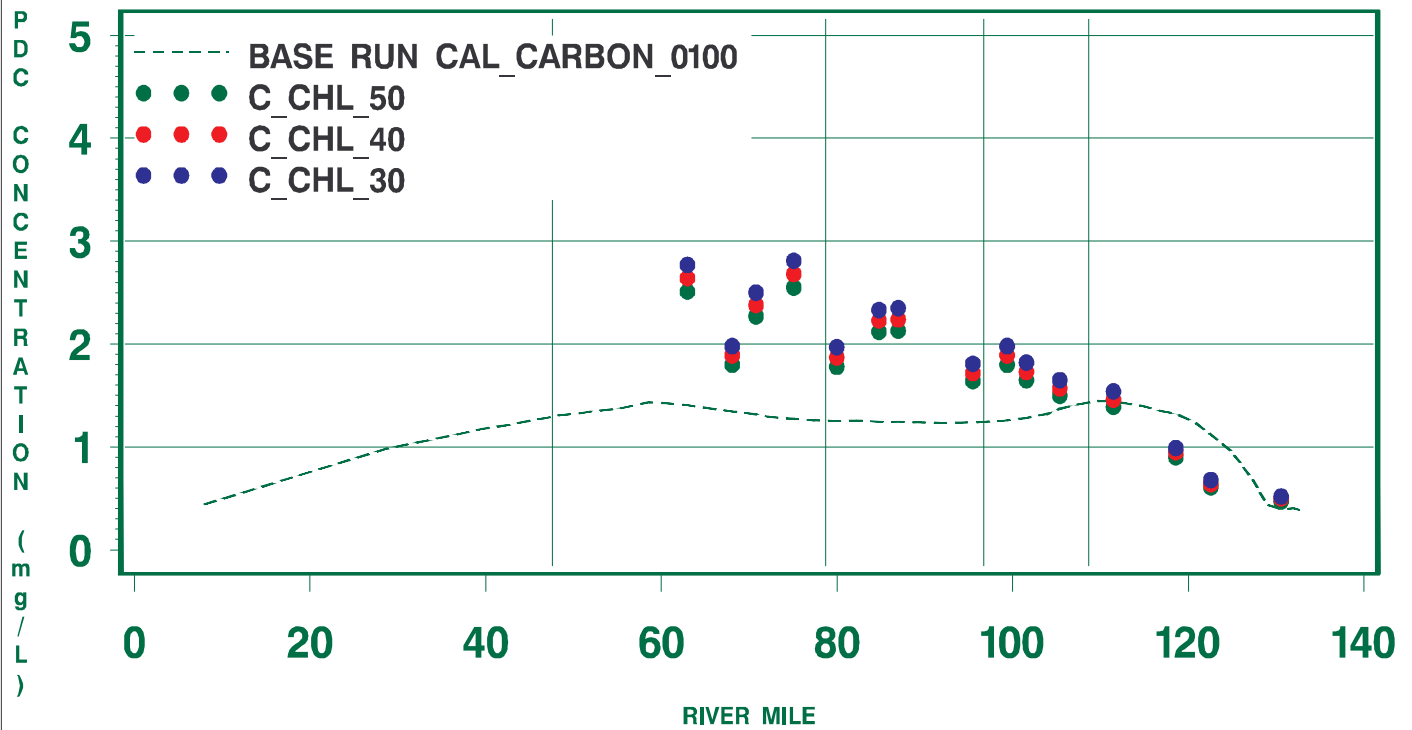
01AUG03 15:18 FILE NUMBER CAL\_CARBON\_0100

## BURIAL RATES FOR TRIBUTARY



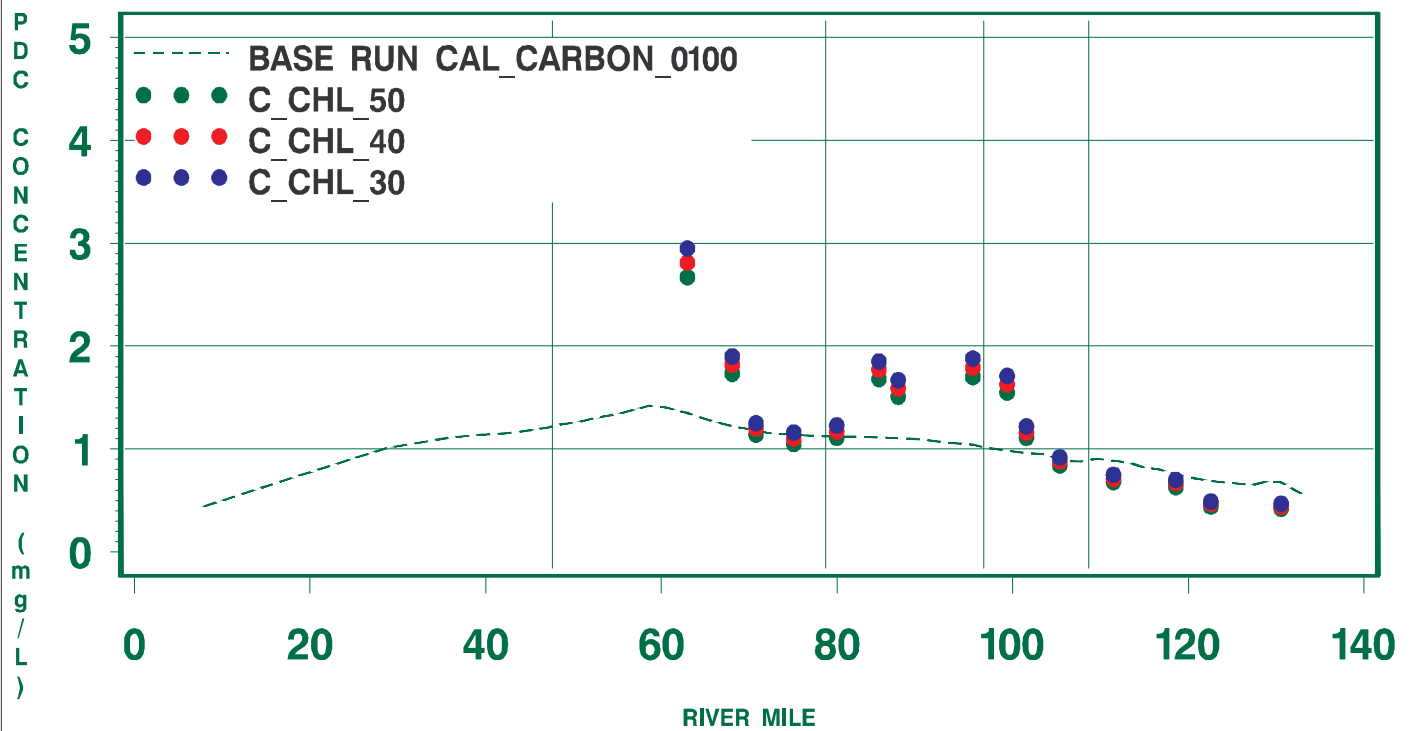
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CALIBRATION RUN ON PDC -- WC PDC ON 3-15-02



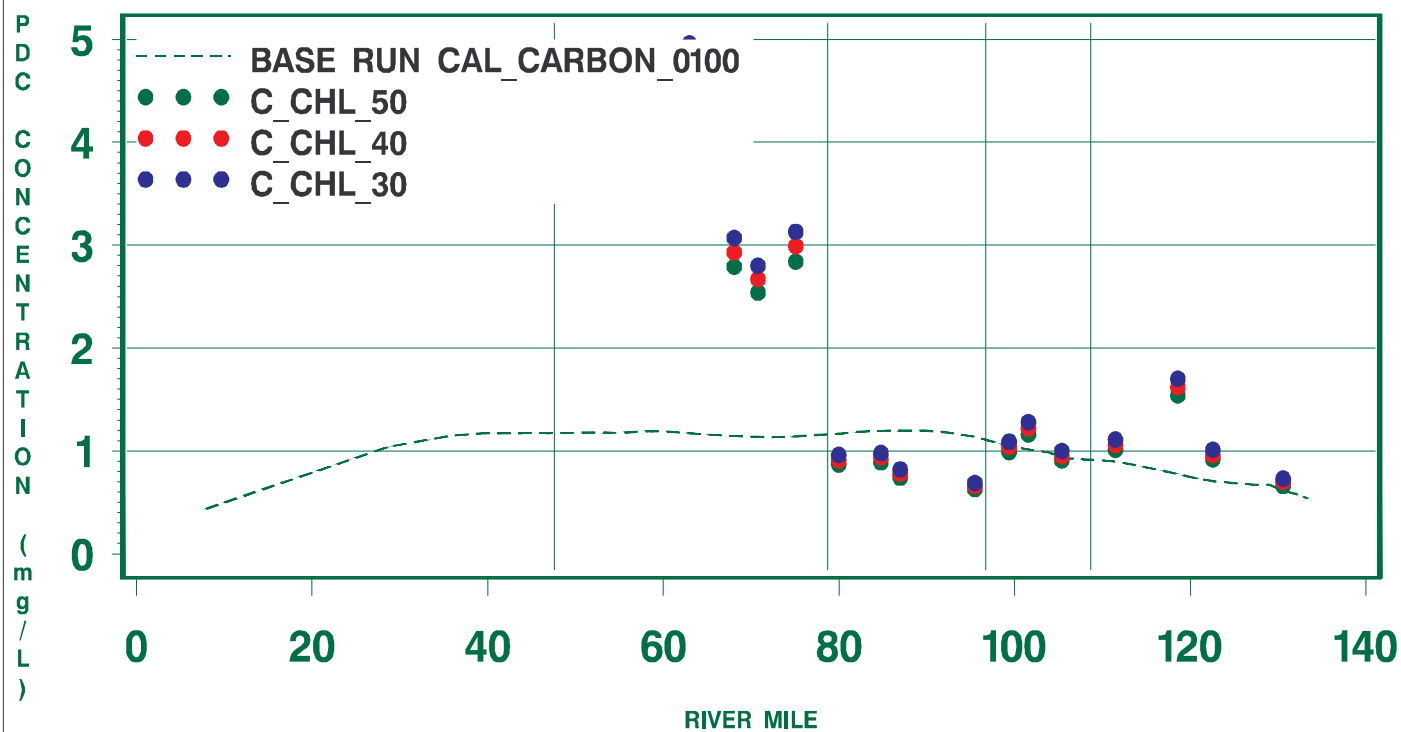
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CALIBRATION RUN ON PDC - WC PDC ON 4-11-02



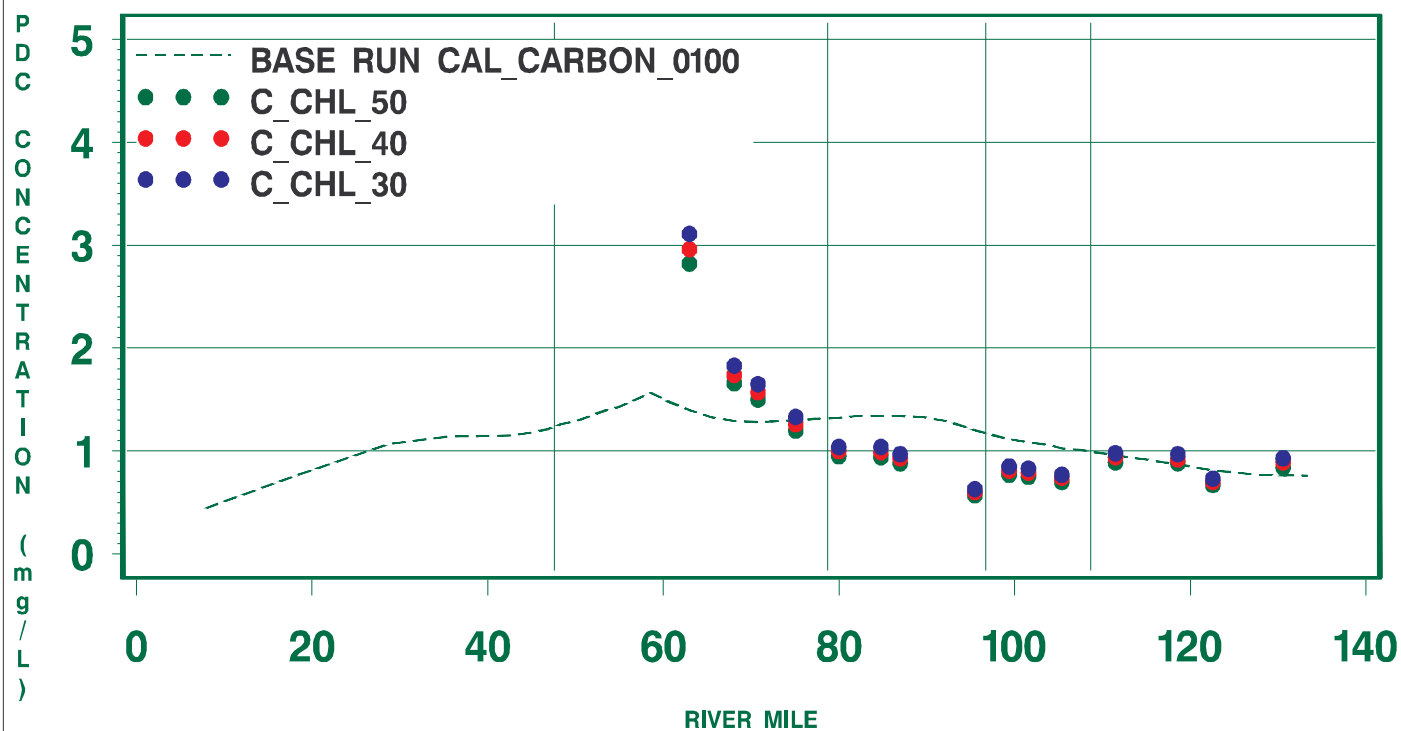
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CALIBRATION RUN ON PDC - WC PDC ON 4-22-02



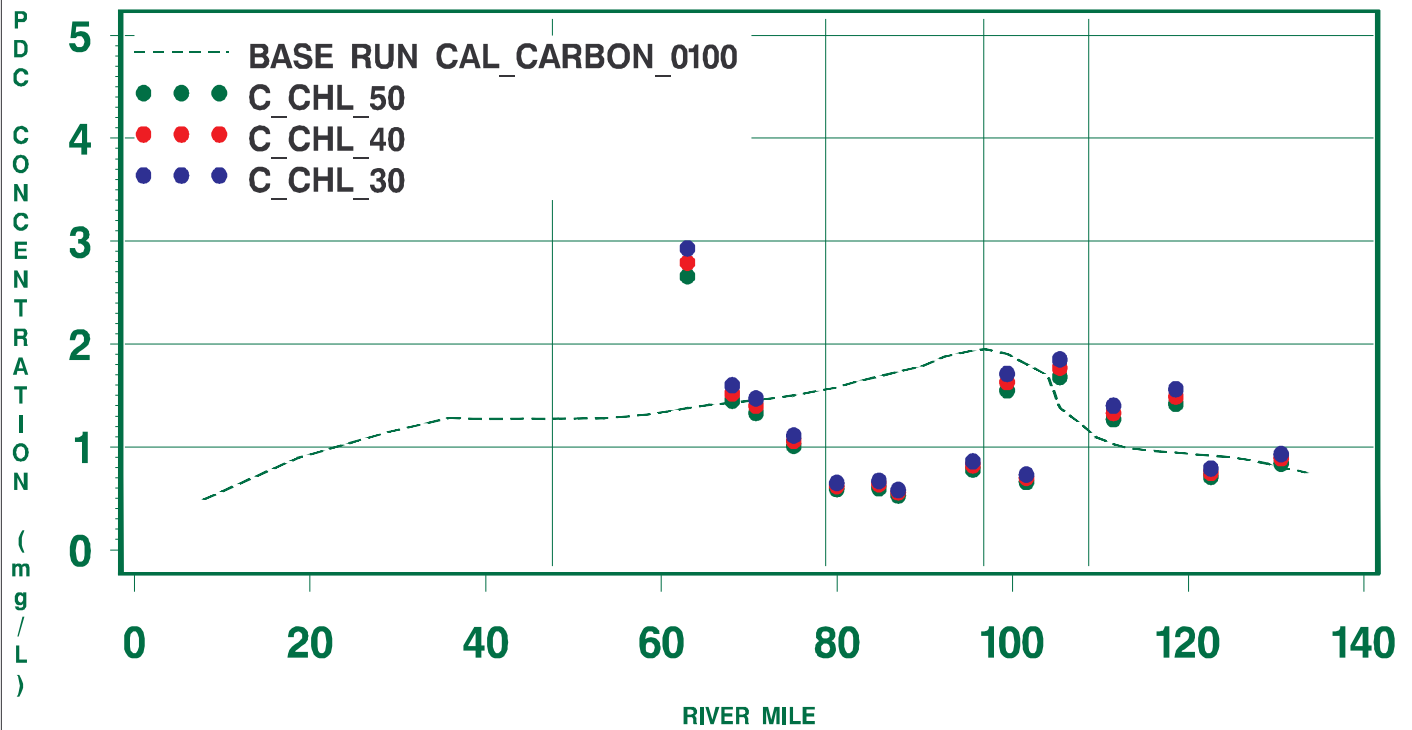
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CALIBRATION RUN ON PDC - WC PDC ON 5-06-02



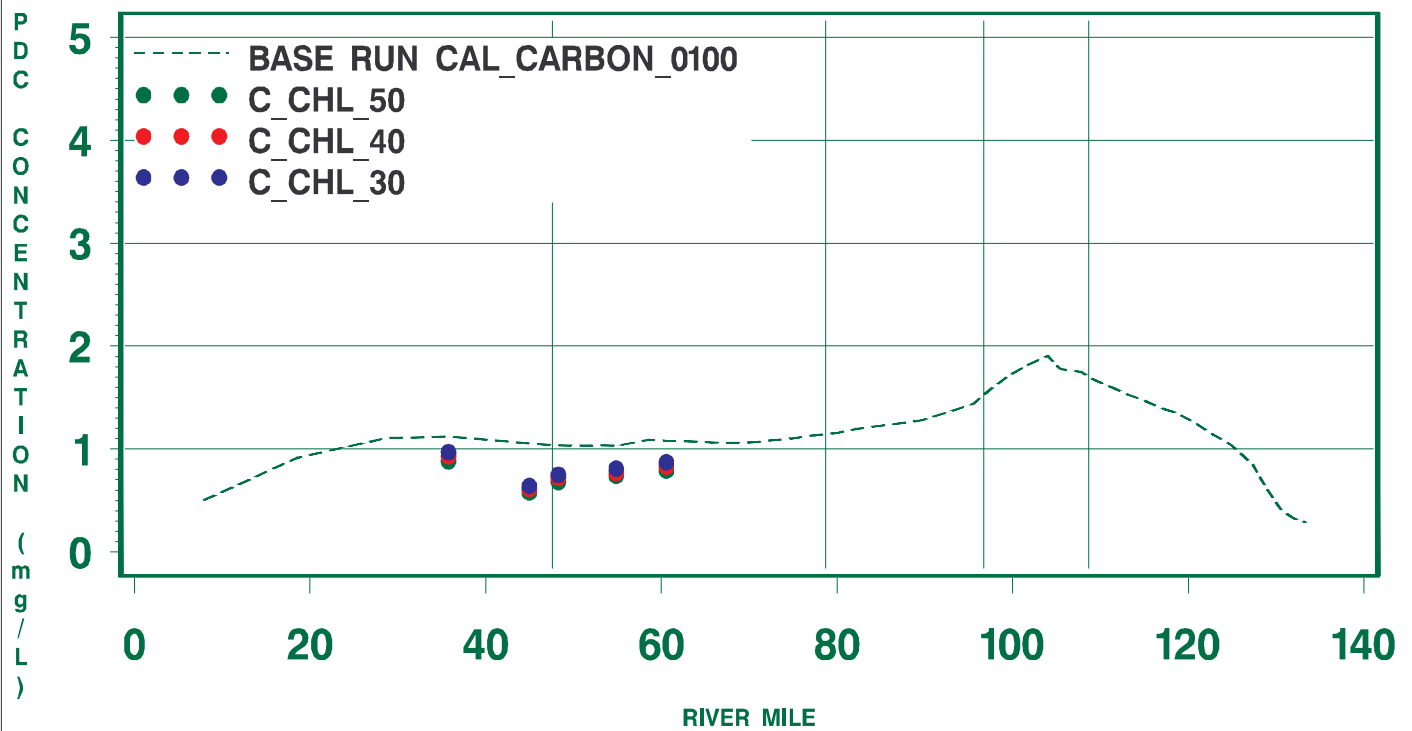
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CALIBRATION RUN ON PDC - WC PDC ON 6-19-02



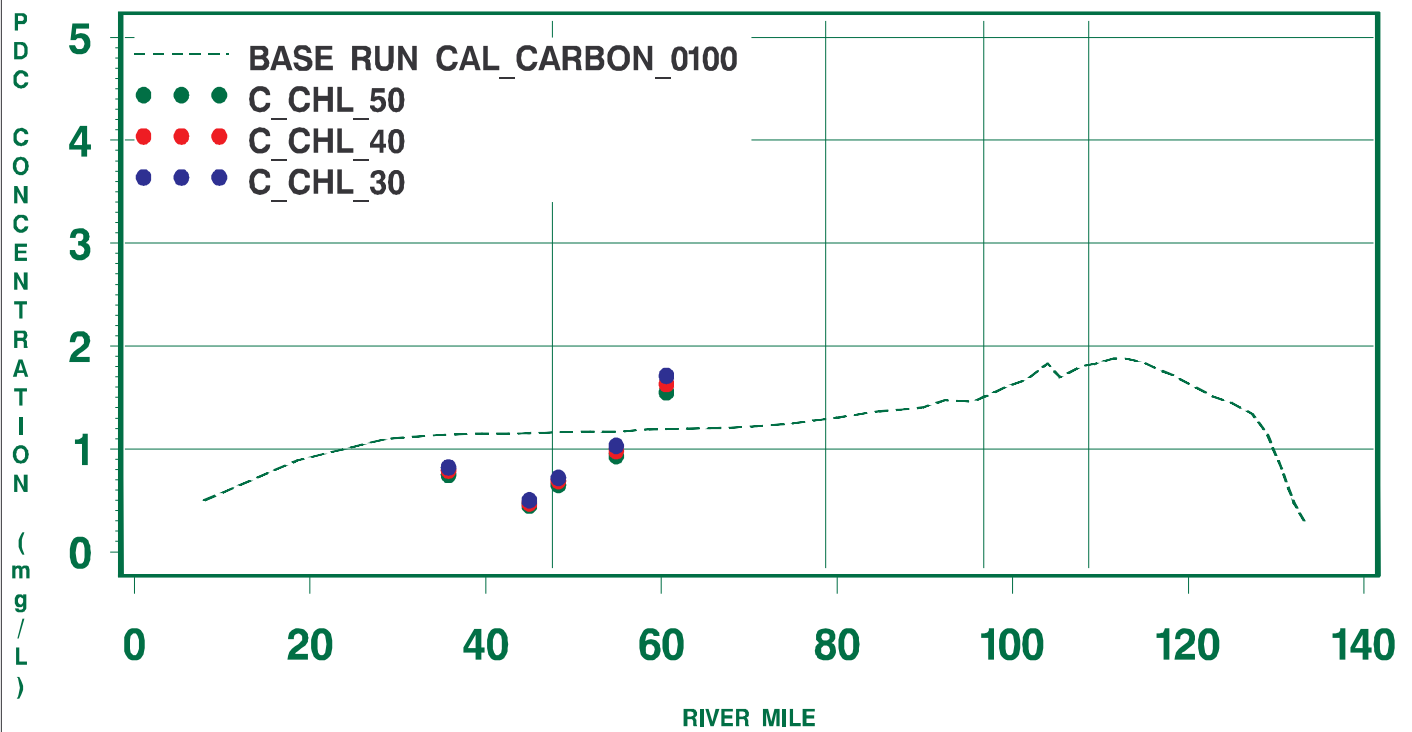
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CALIBRATION RUN ON PDC - WC PDC ON 08-05-02



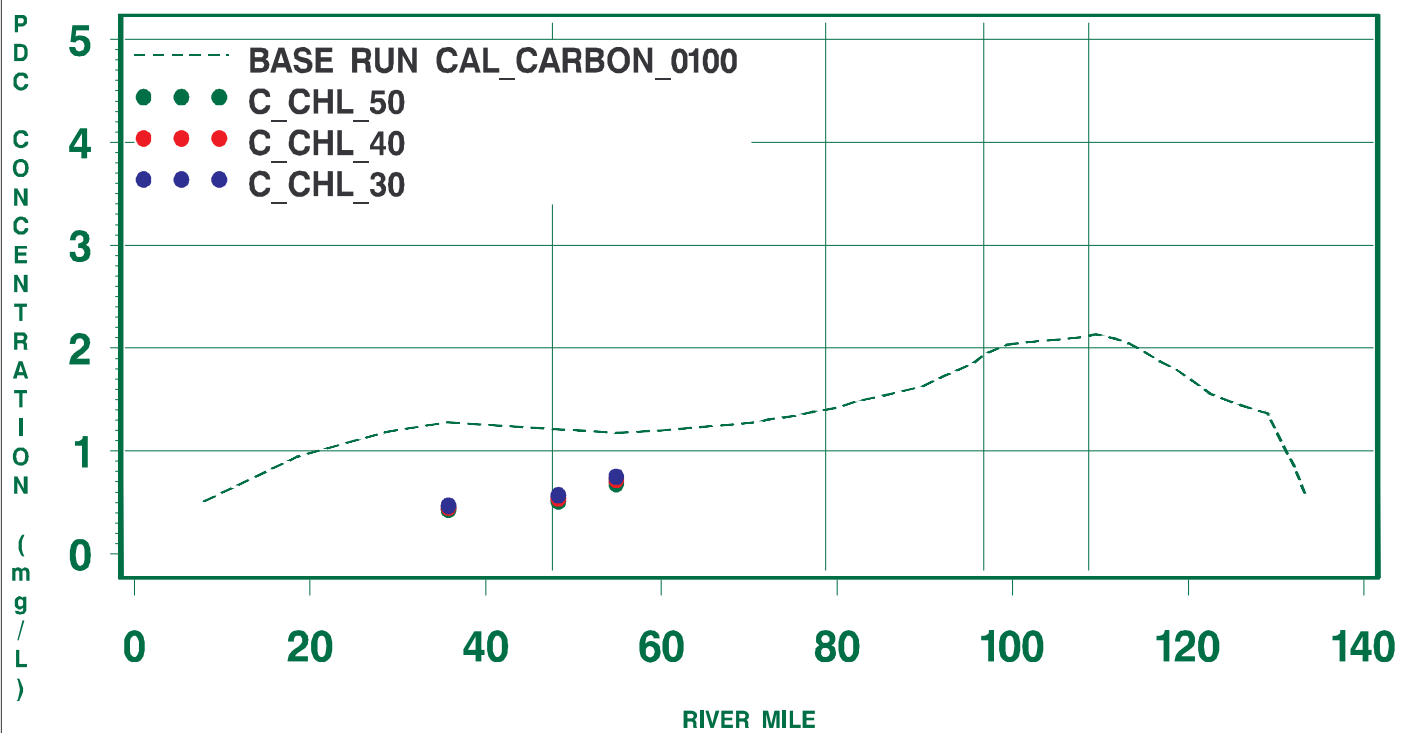
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CALIBRATION RUN ON PDC - WC PDC ON 08-19-02



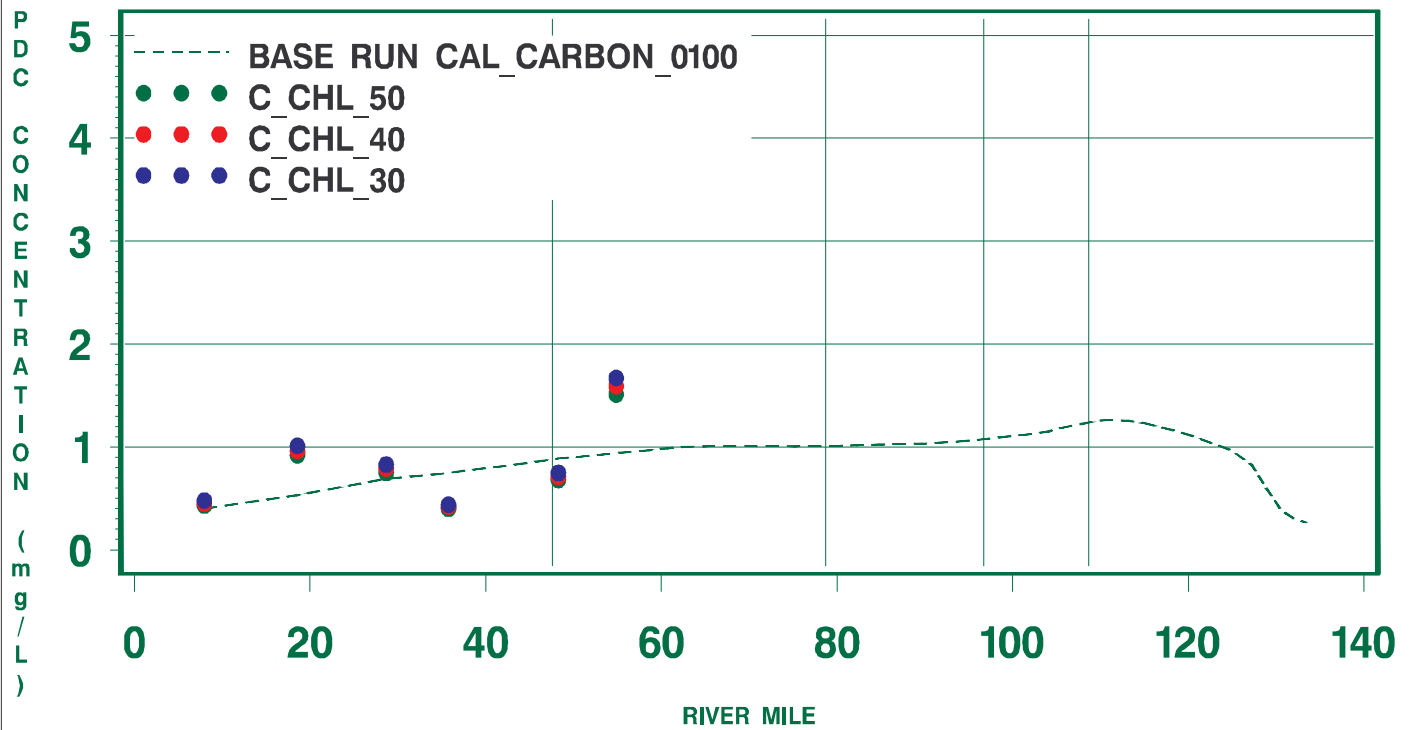
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CALIBRATION RUN ON PDC - WC PDC ON 09-03-02



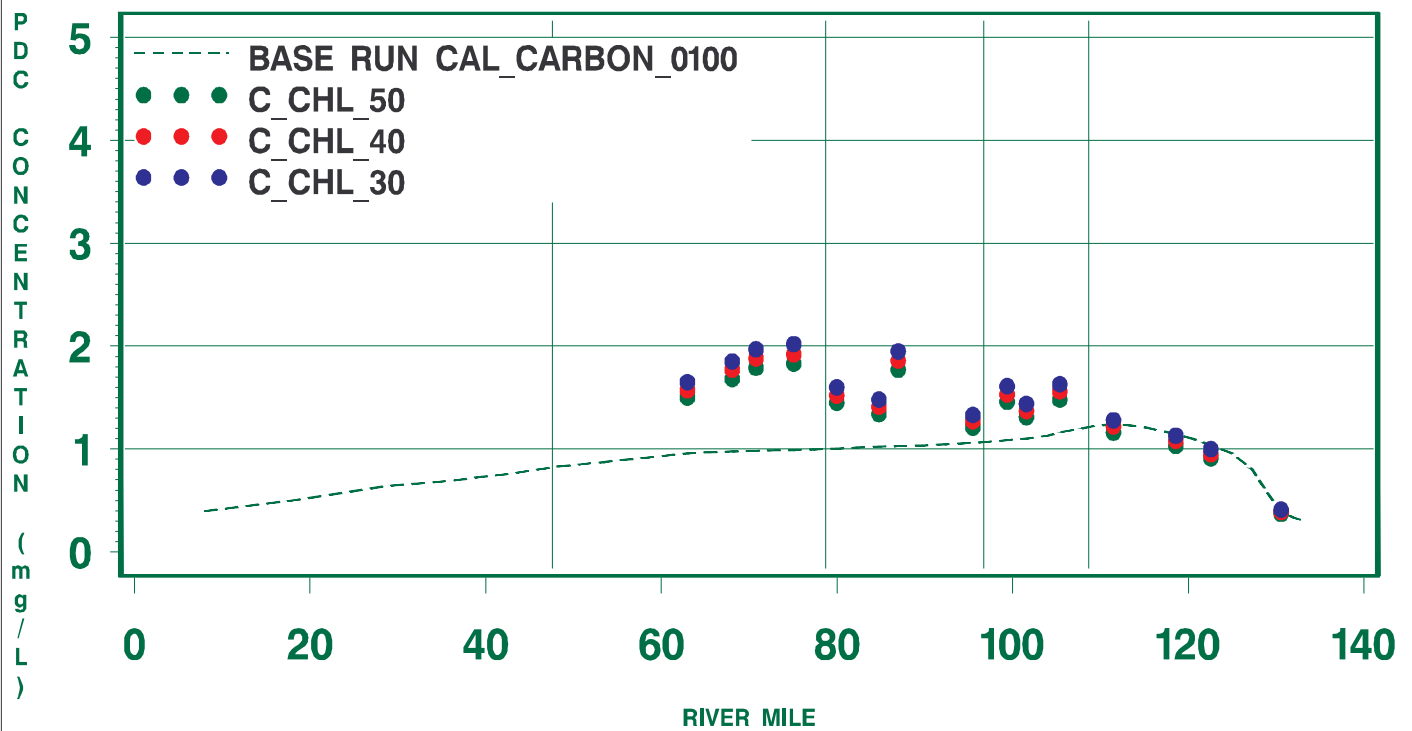
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CALIBRATION RUN ON PDC - WC PDC ON 09-23-02



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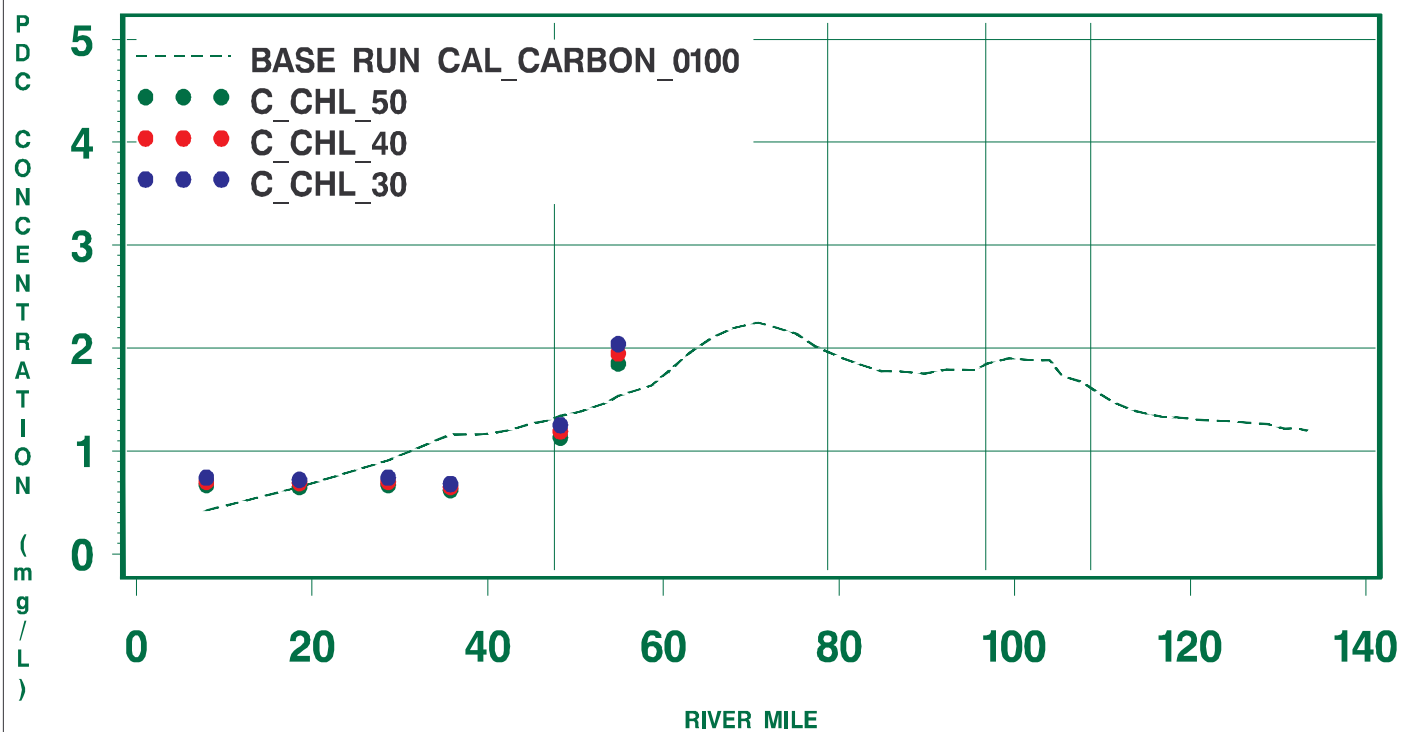
CALIBRATION RUN ON PDC - WC PDC ON 10-08-02



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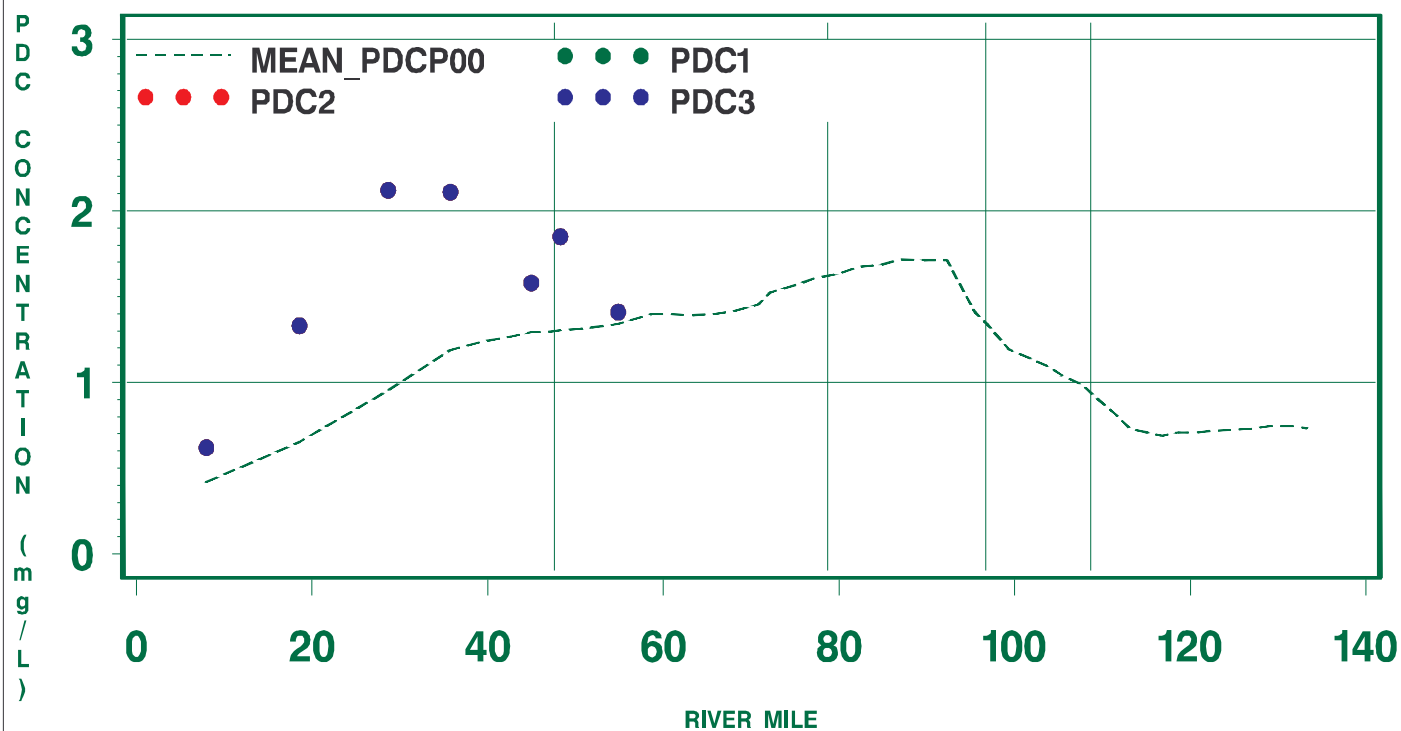


CALIBRATION RUN ON PDC - WC PDC ON 11-21-02



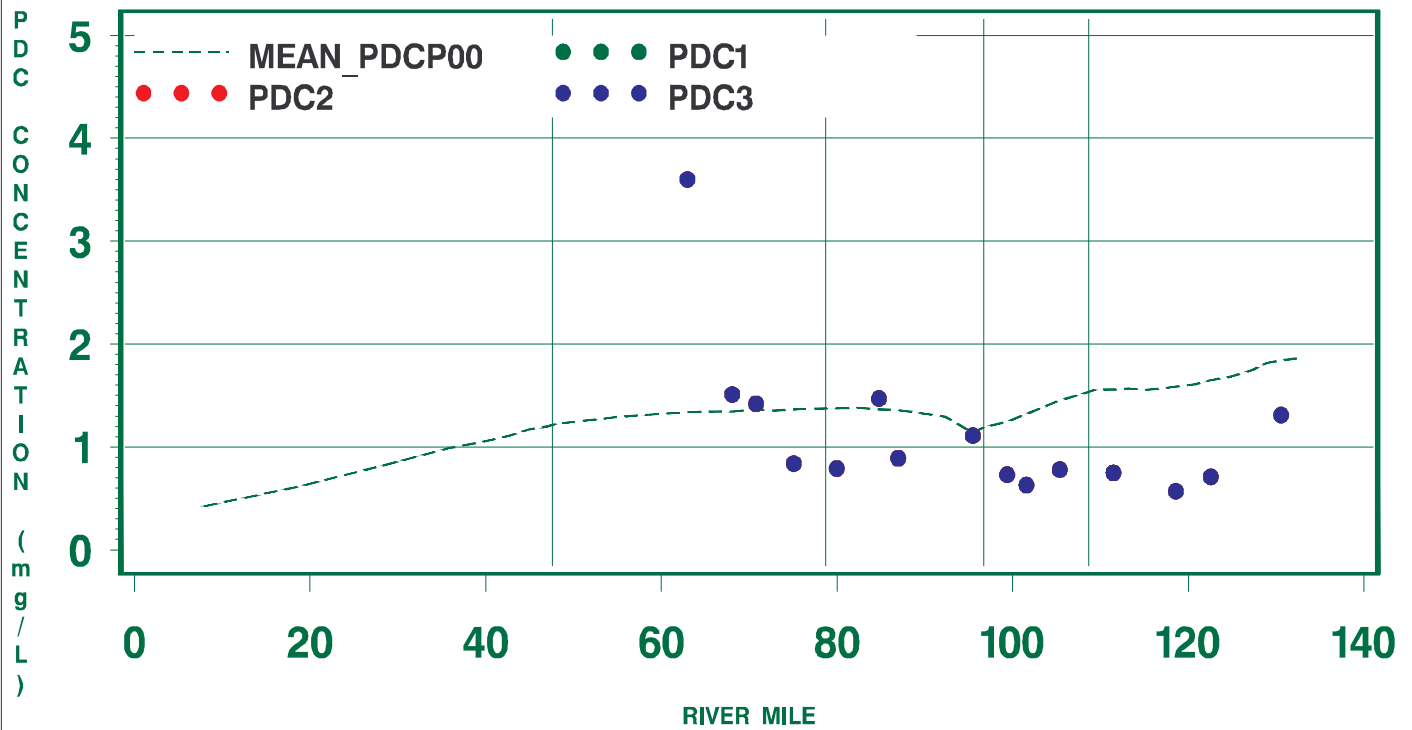
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CALIBRATION RUN ON PDC - WC PDC ON 3-10-03



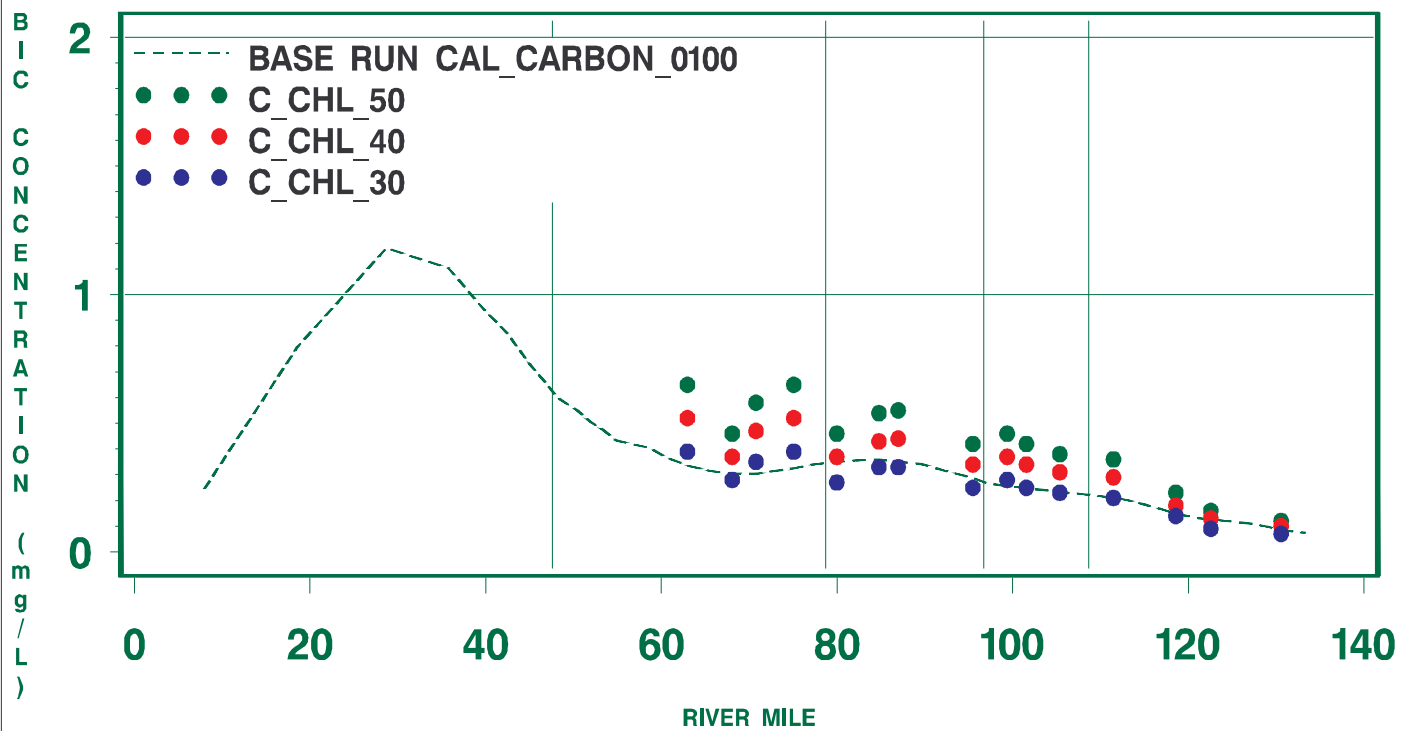
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CALIBRATION RUN ON PDC - WC PDC ON 3-19-03



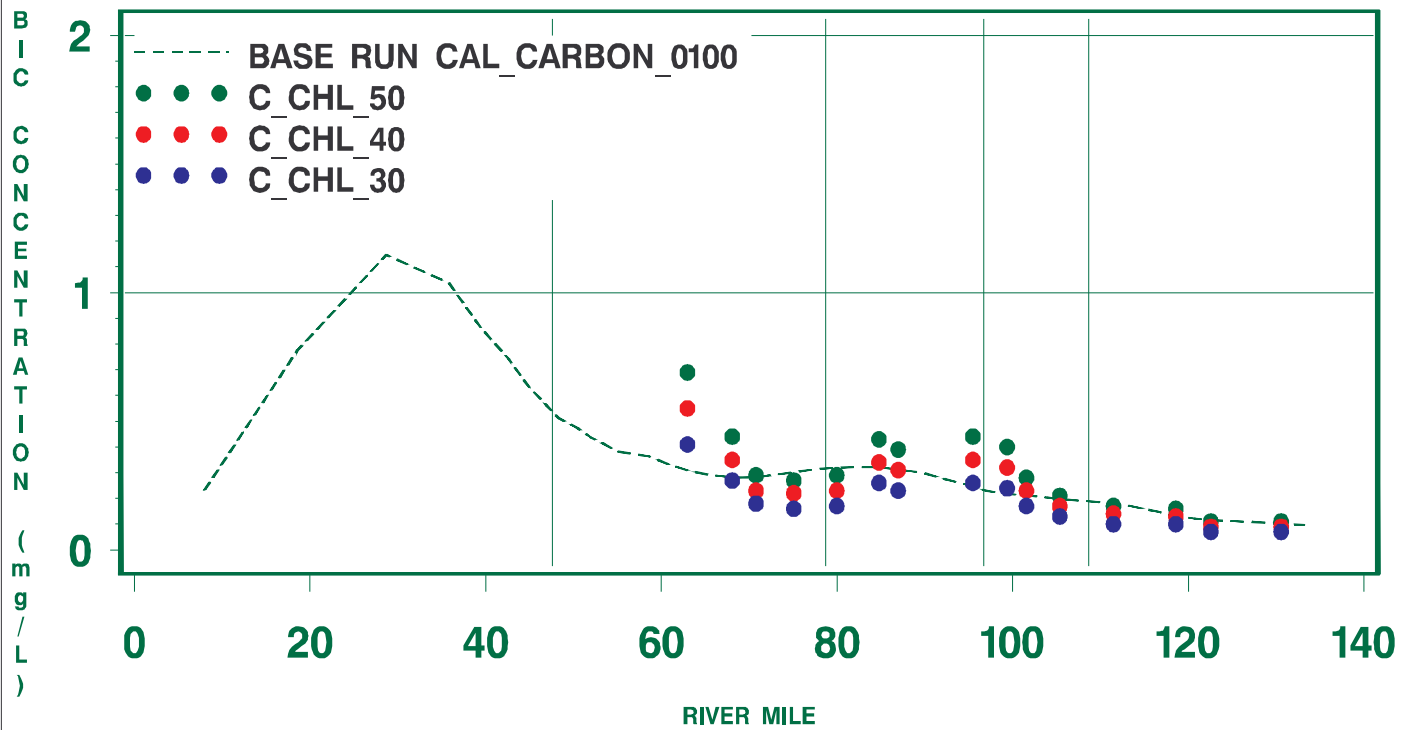
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CALIBRATION RUN ON BIC - WC BIC ON 3-15-02



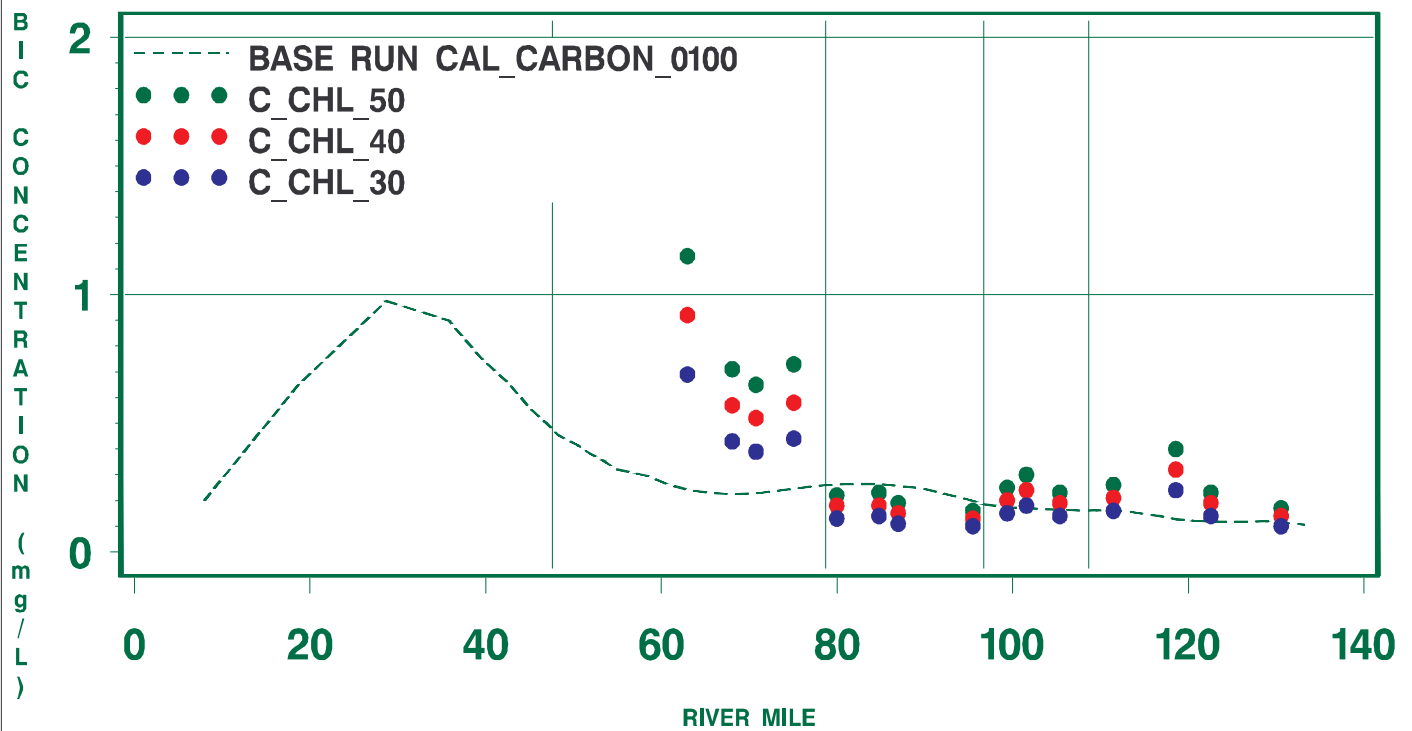
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CALIBRATION RUN ON BIC - WC BIC ON 4-11-02



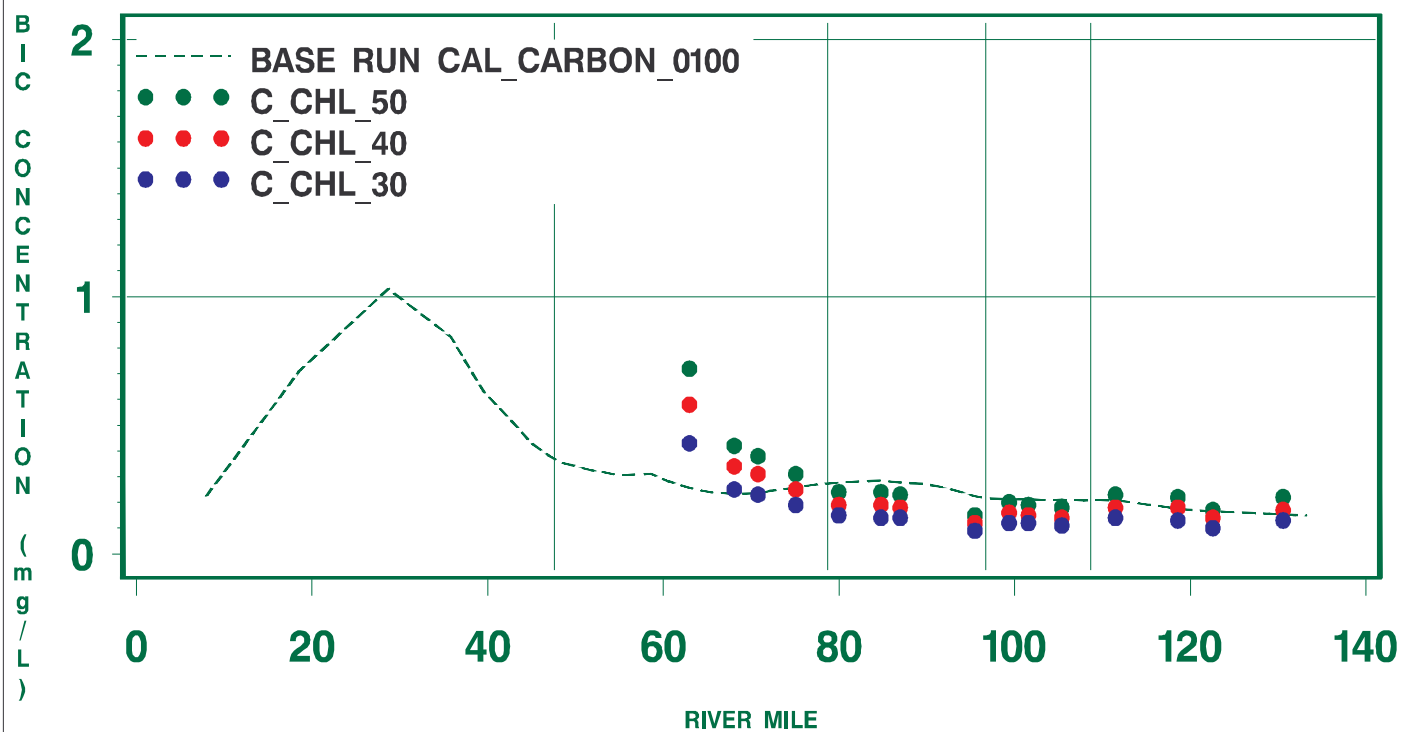
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CALIBRATION RUN ON BIC - WC BIC ON 4-22-02



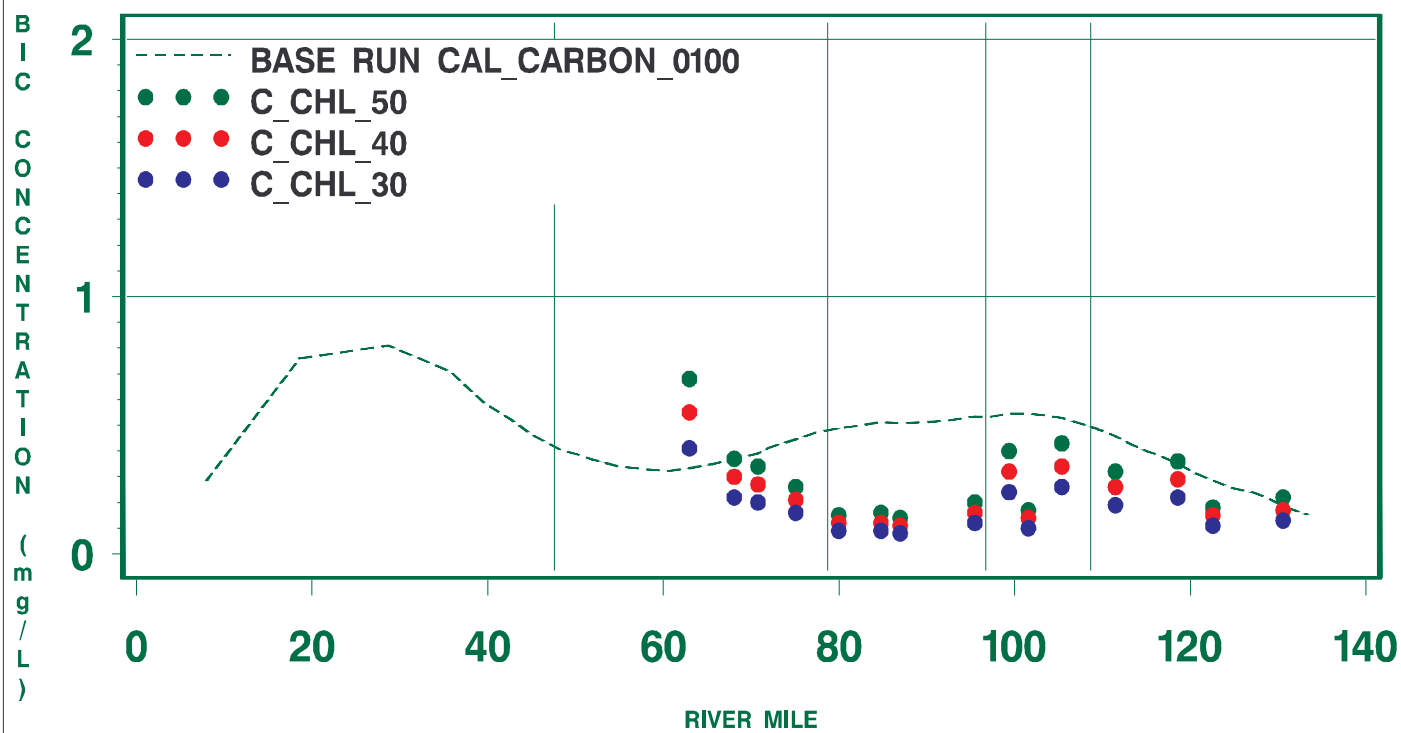
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CALIBRATION RUN ON BIC - WC BIC ON 5-06-02



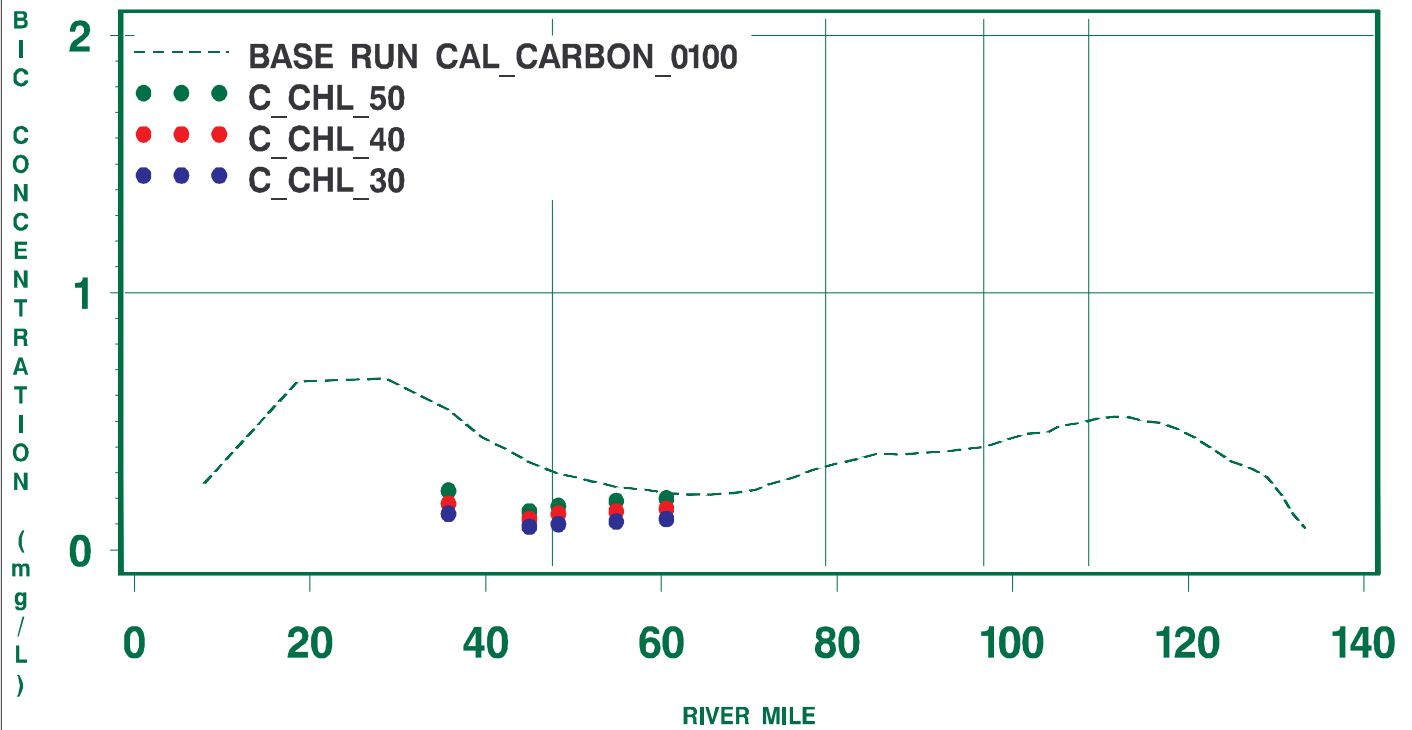
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CALIBRATION RUN ON BIC - WC BIC ON 6-19-02



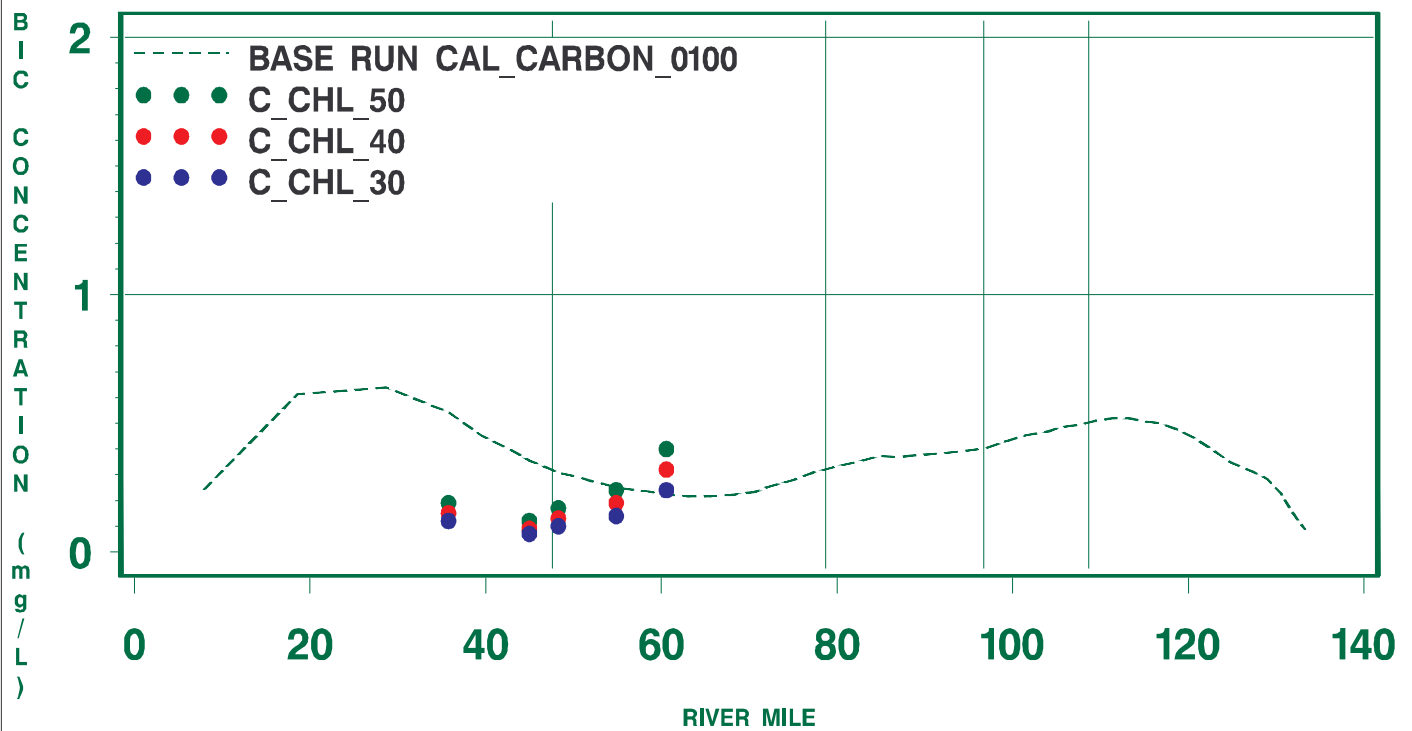
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CALIBRATION RUN ON BIC - WC BIC ON 08-05-02



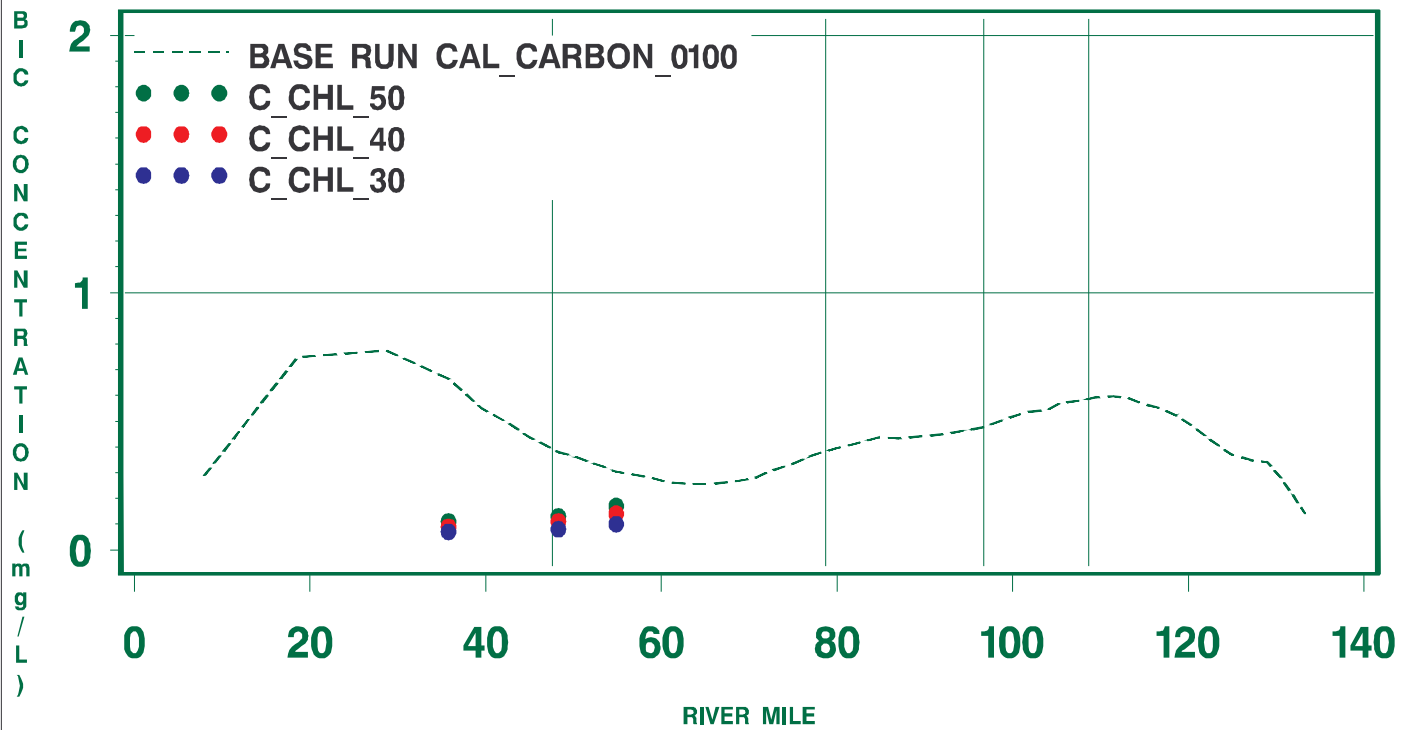
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CALIBRATION RUN ON BIC - WC BIC ON 08-19-02



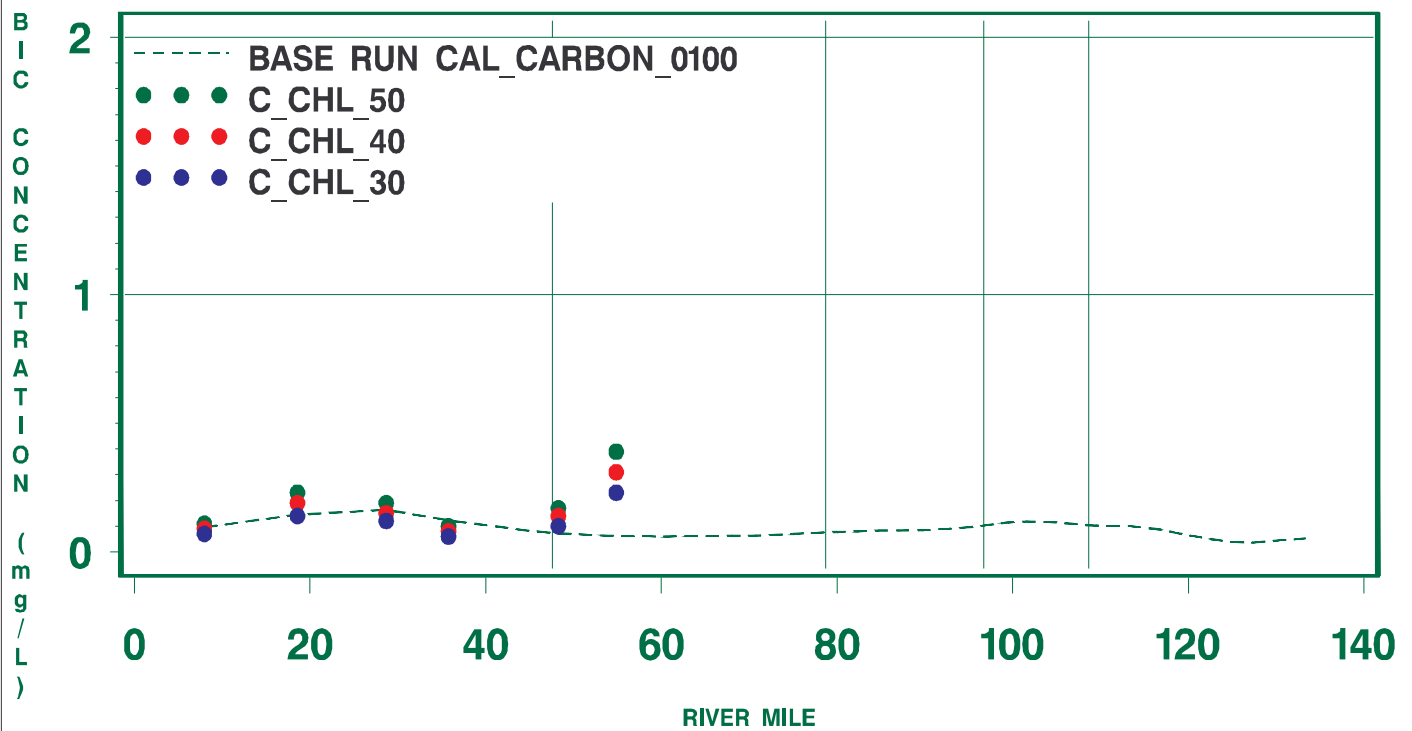
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CALIBRATION RUN ON BIC - WC BIC ON 09-03-02



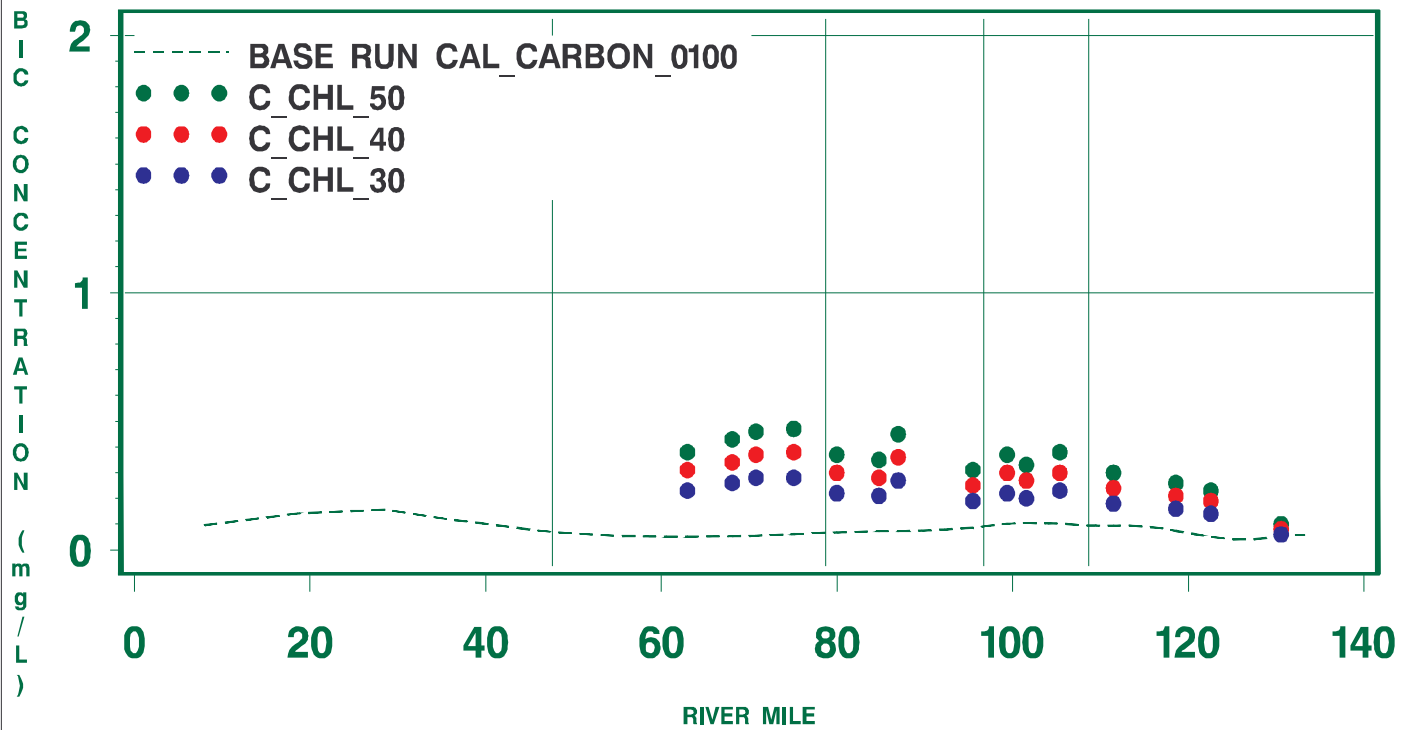
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CALIBRATION RUN ON BIC - WC BIC ON 09-23-02



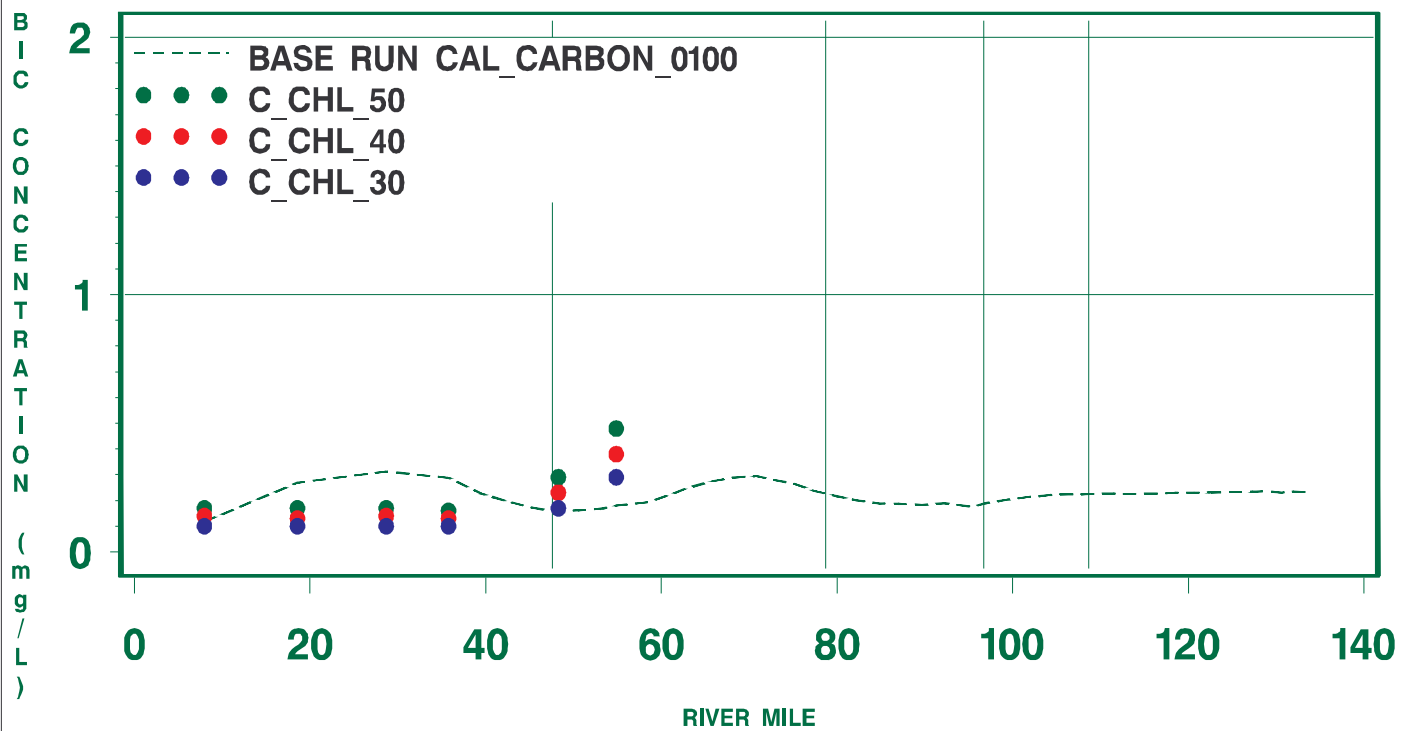
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CALIBRATION RUN ON BIC - WC BIC ON 10-08-02



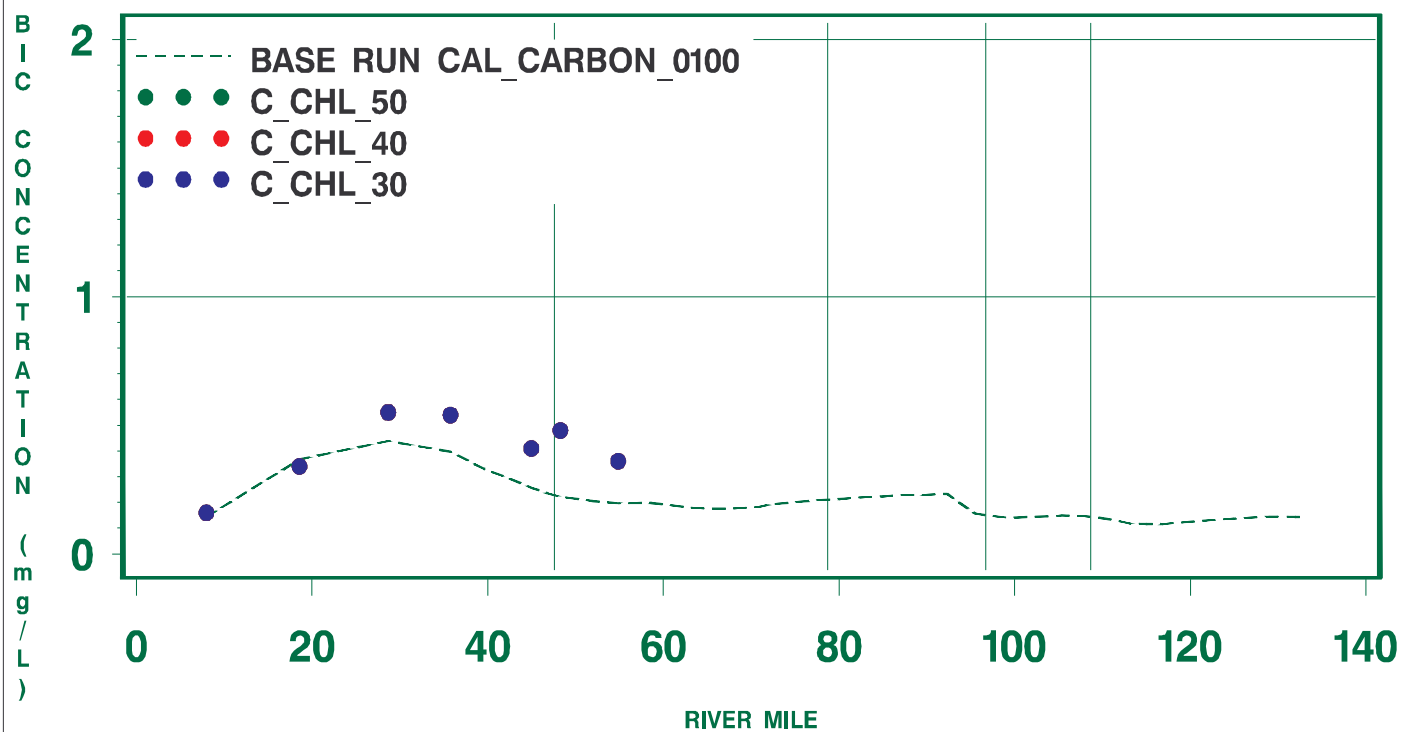
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CALIBRATION RUN ON BIC - WC BIC ON 11-21-02



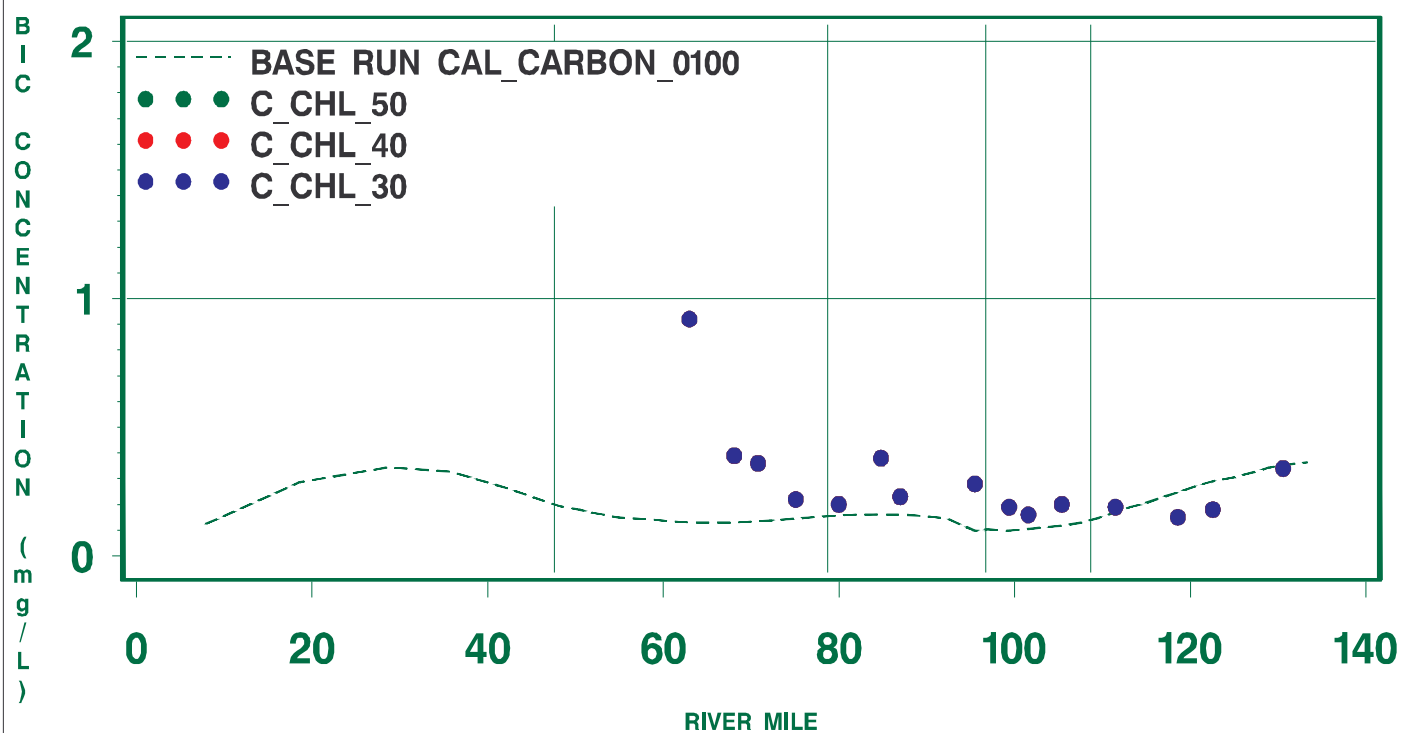
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CALIBRATION RUN ON BIC - WC BIC ON 3-10-03



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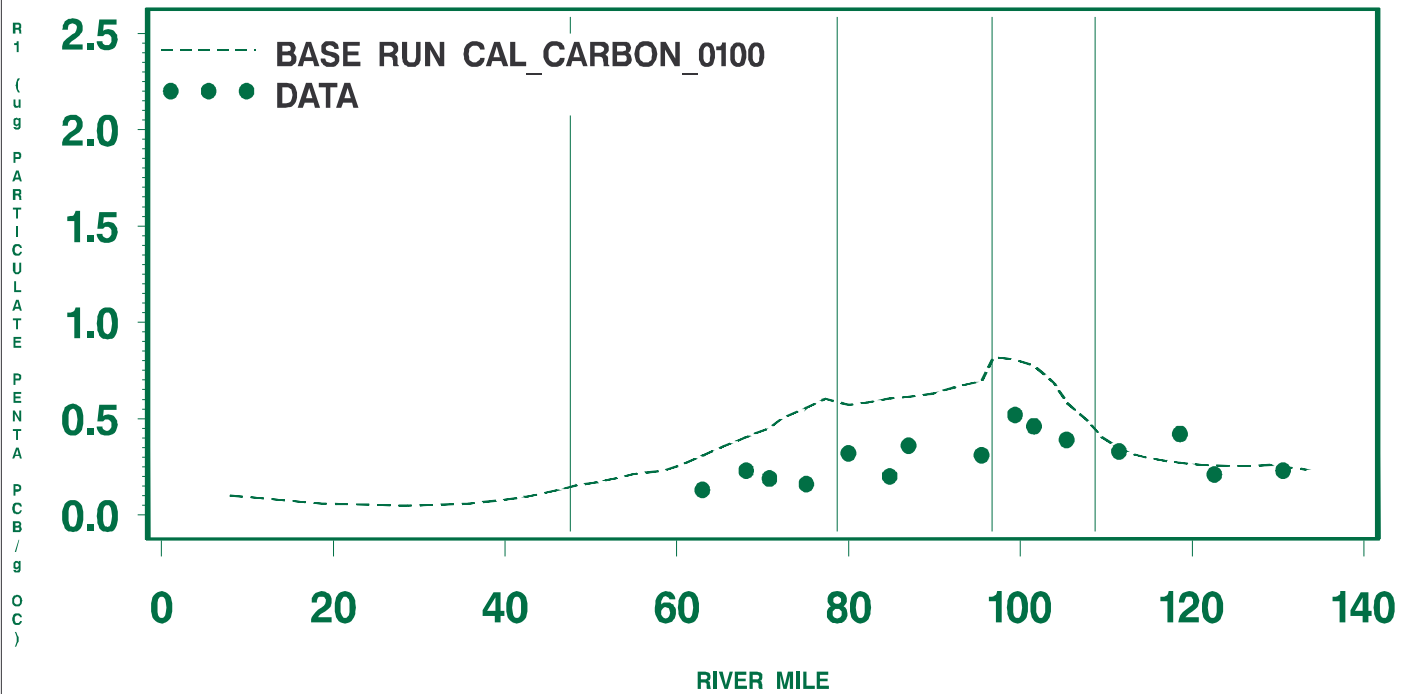
CALIBRATION RUN ON BIC - WC BIC ON 3-19-03



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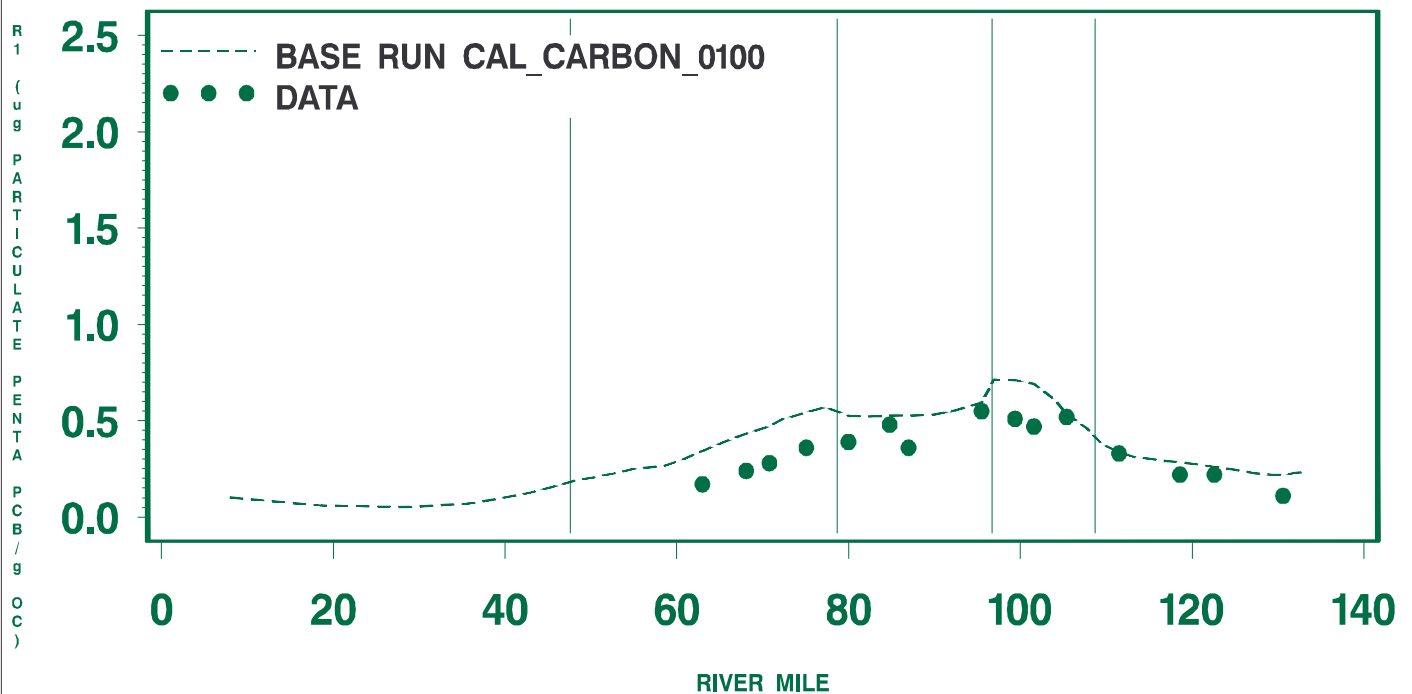


# CALIBRATION RUN ON R1 - WC R1 ON 3-15-02



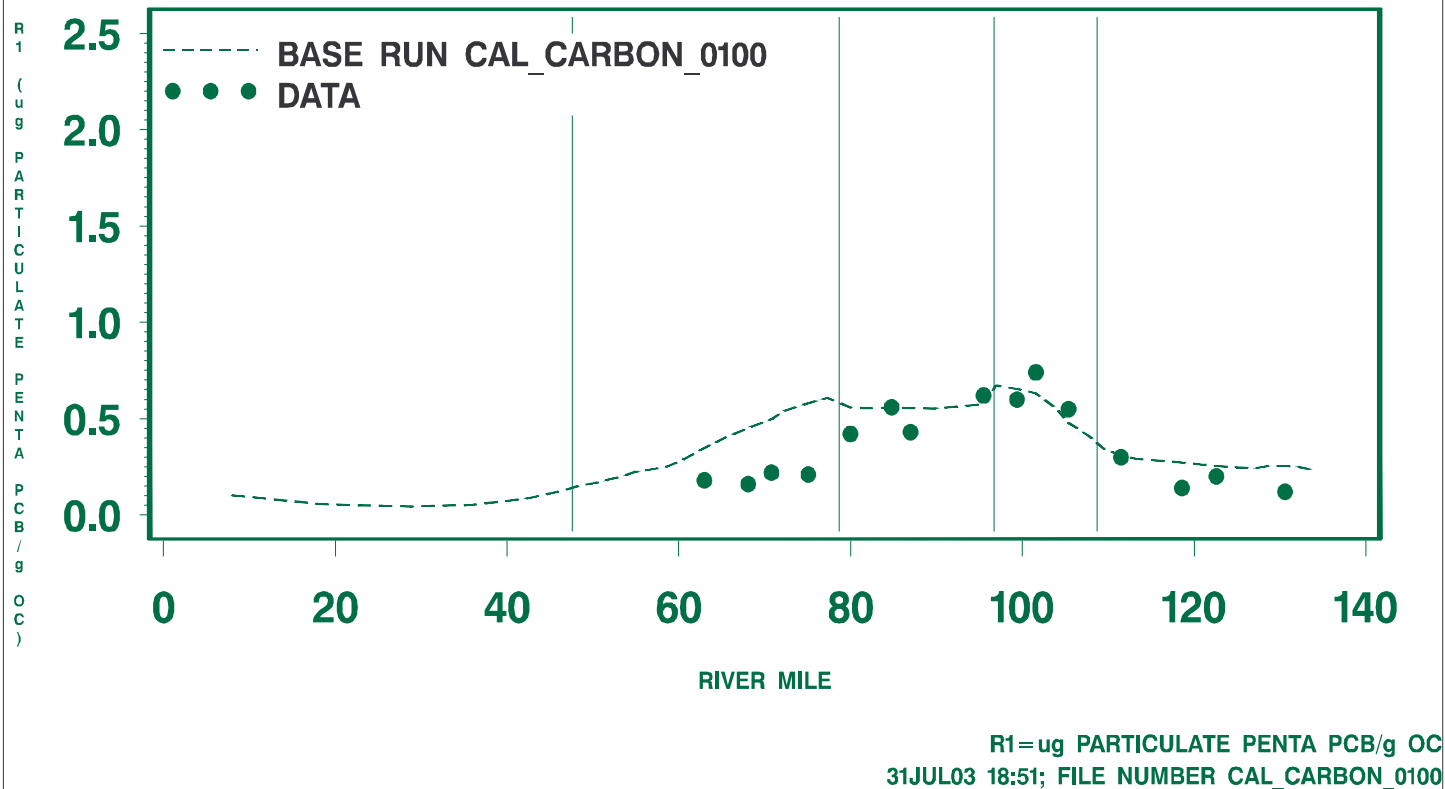
R1=ug PARTICULATE PENTA PCB/g OC  
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# CALIBRATION RUN ON R1 - WC R1 ON 4-11-02

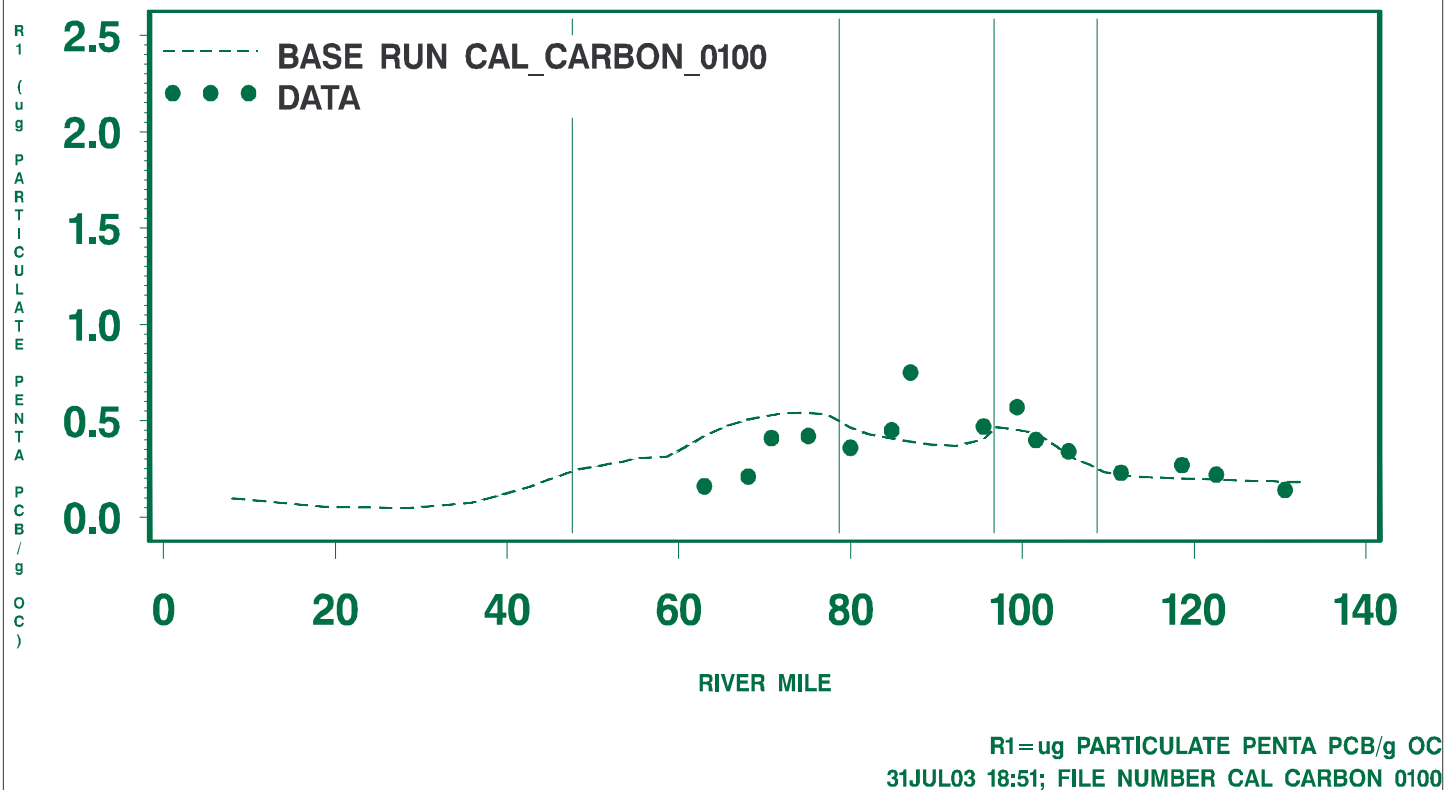


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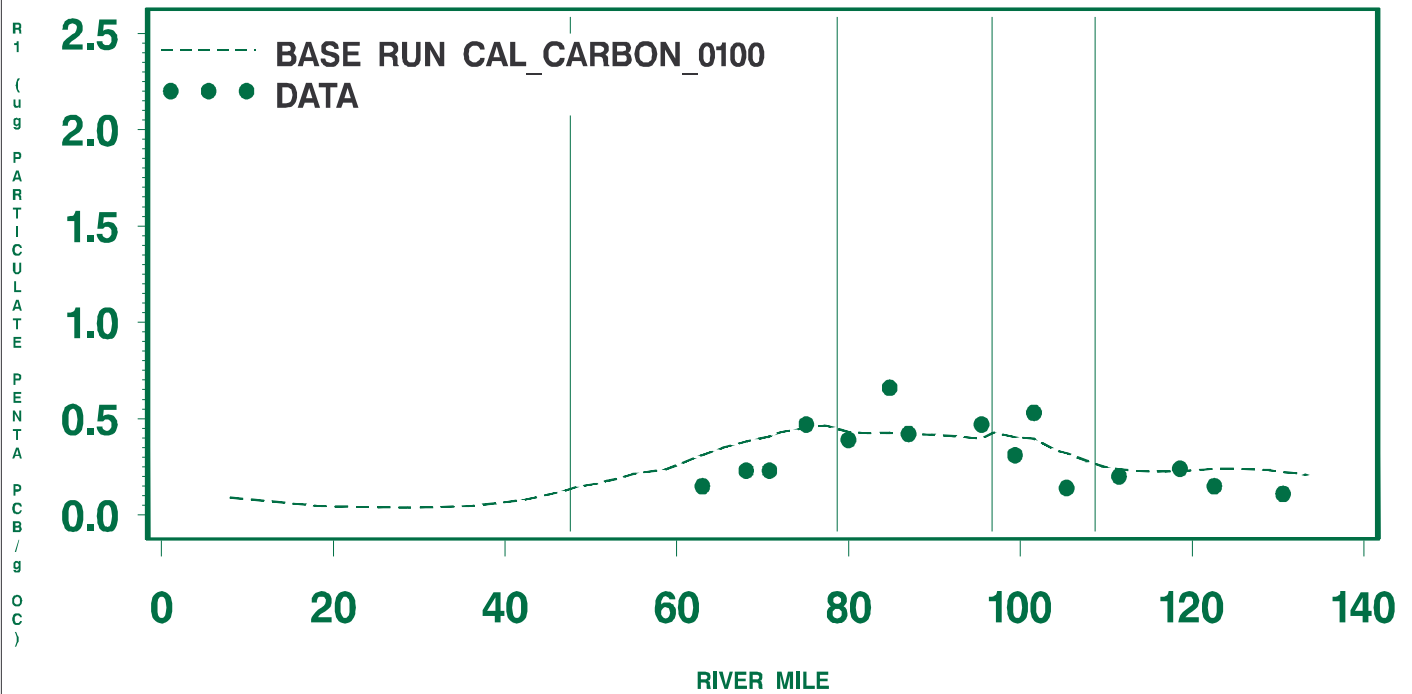
CALIBRATION RUN ON R1 - WC R1 ON 4-22-02



CALIBRATION RUN ON R1 - WC R1 ON 5-06-02

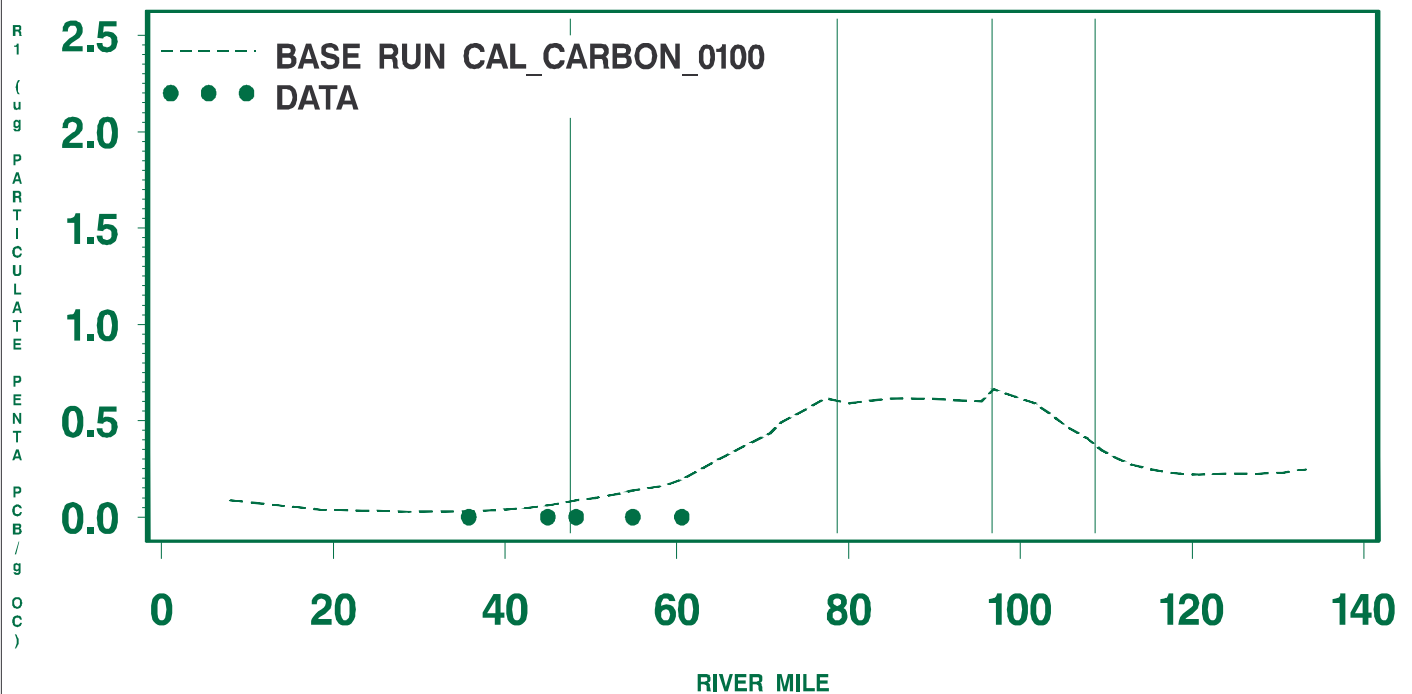


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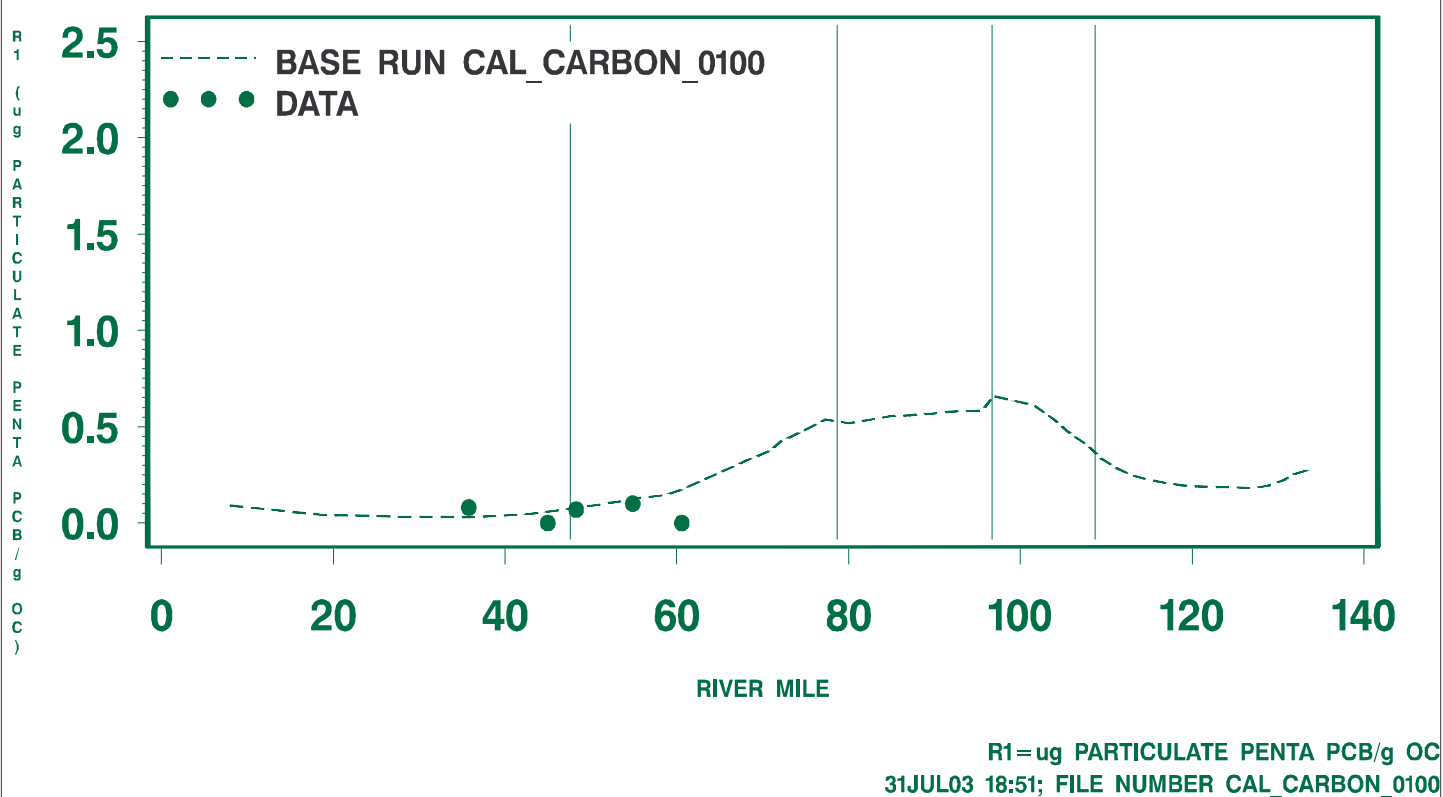
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# CALIBRATION RUN ON R1 - WC R1 ON 08-05-02

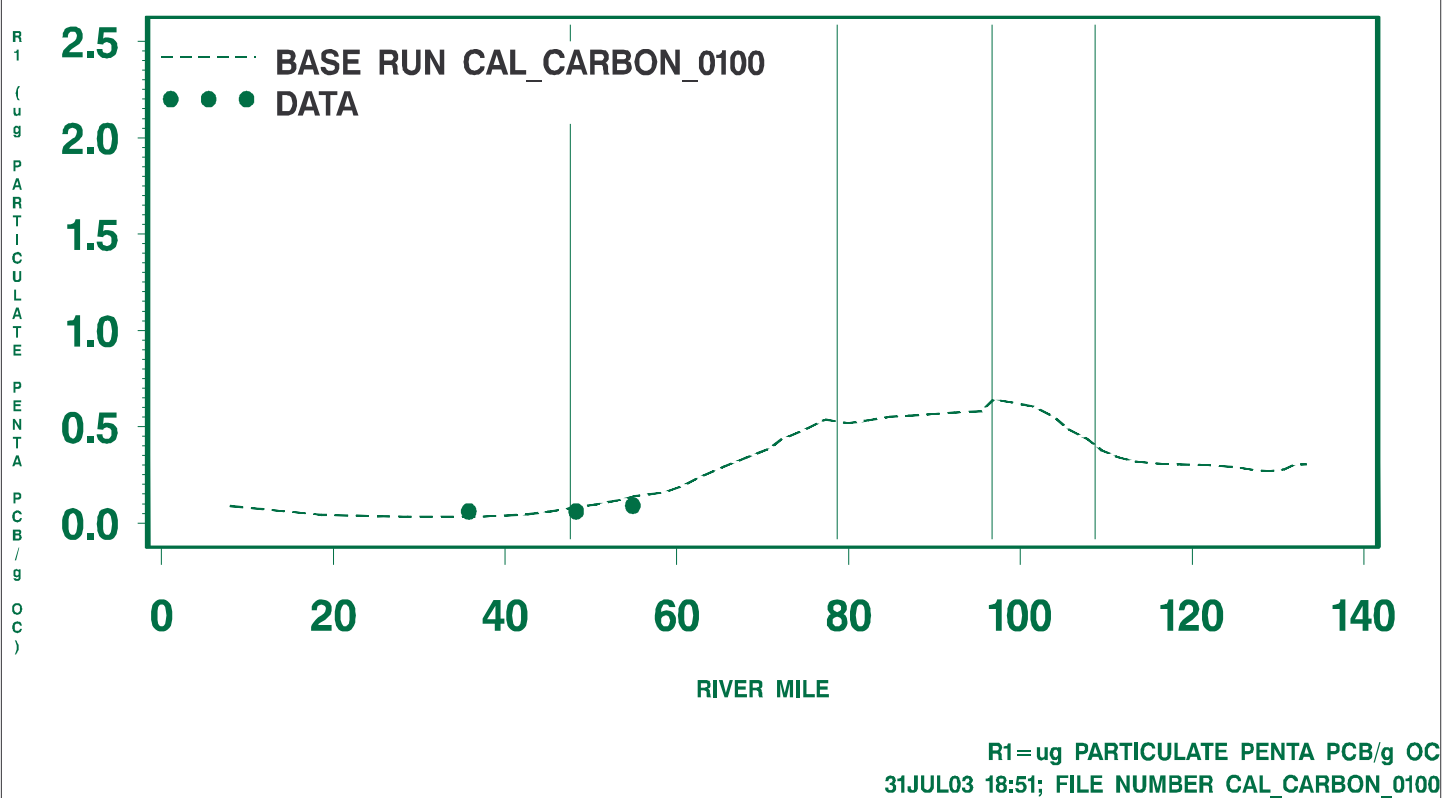


R1=ug PARTICULATE PENTA PCB/g OC  
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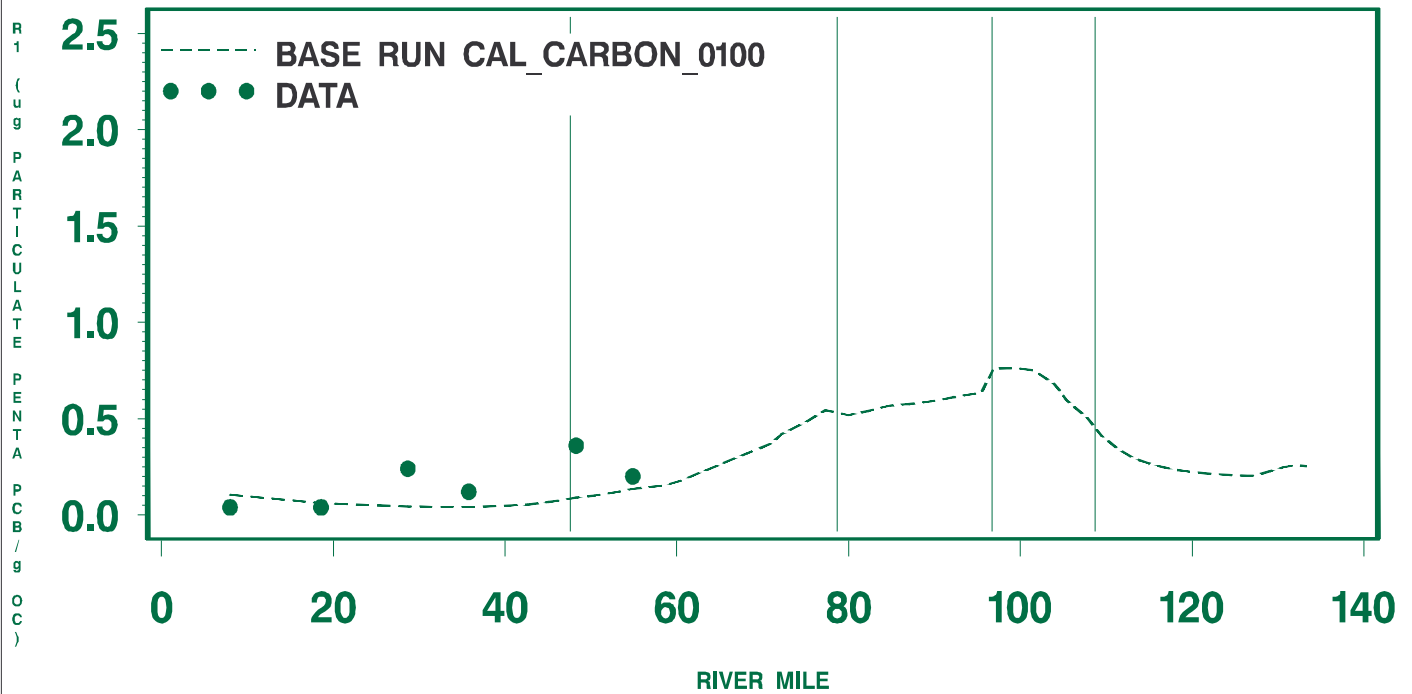
CALIBRATION RUN ON R1 - WC R1 ON 08-19-02



CALIBRATION RUN ON R1 - WC R1 ON 09-03-02

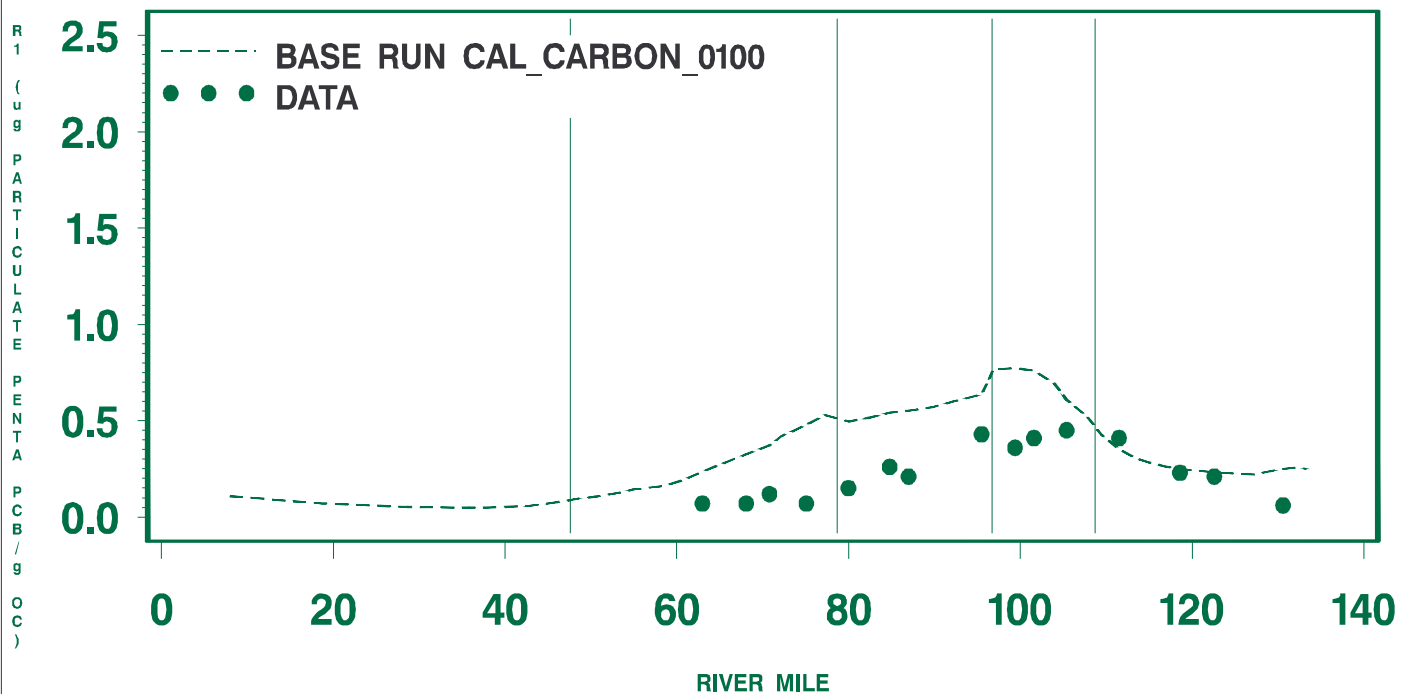


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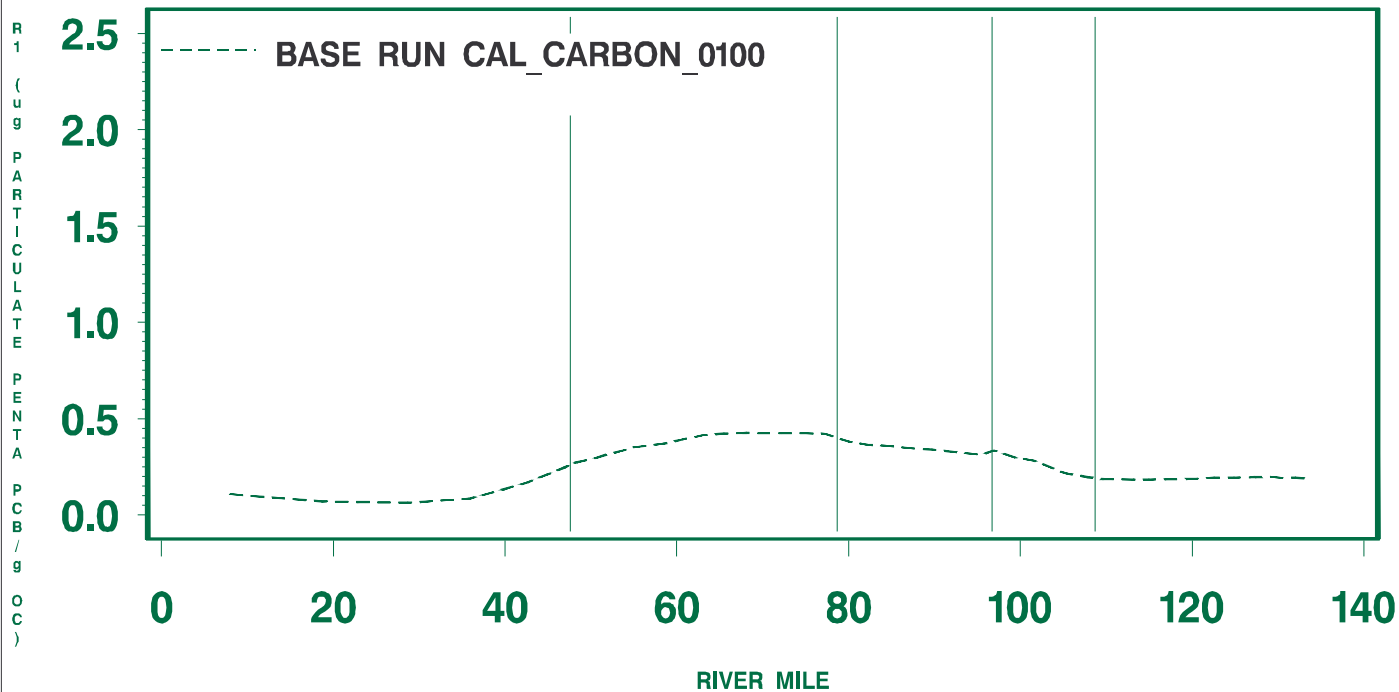
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# CALIBRATION RUN ON R1 - WC R1 ON 10-08-02



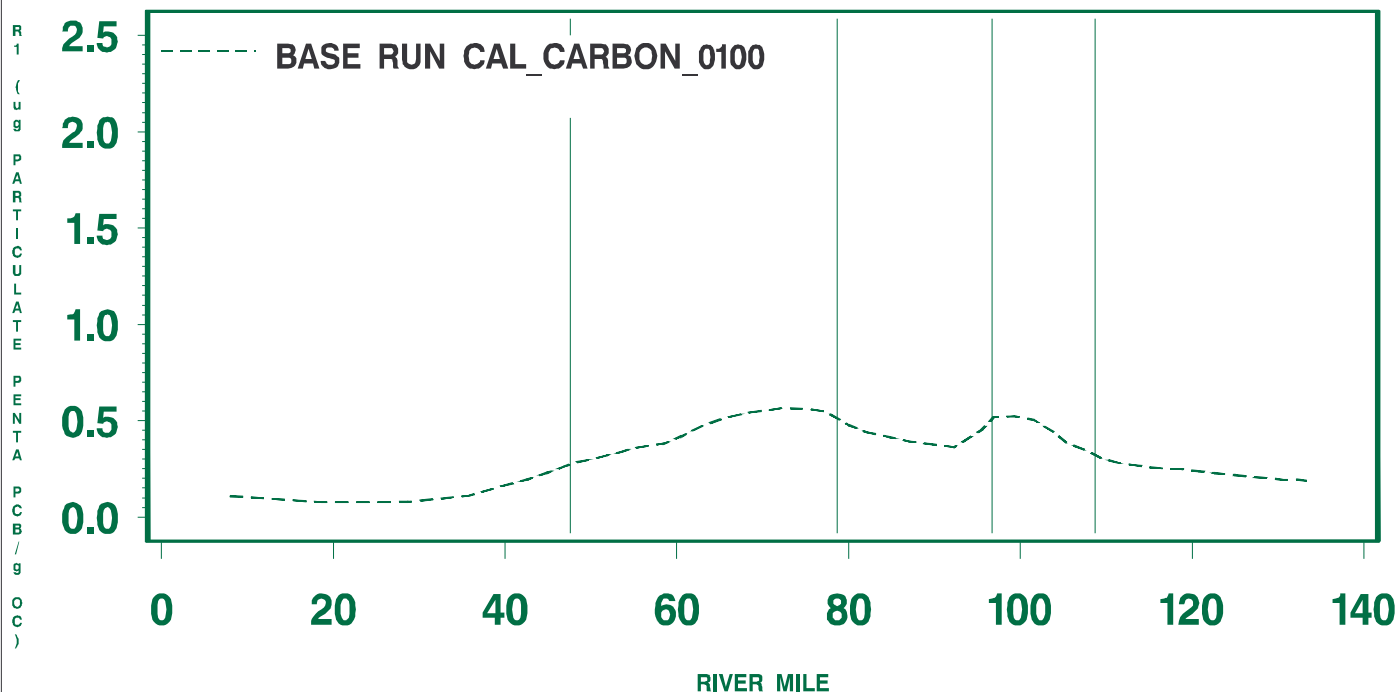
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CALIBRATION RUN ON R1 - WC R1 ON 11-21-02



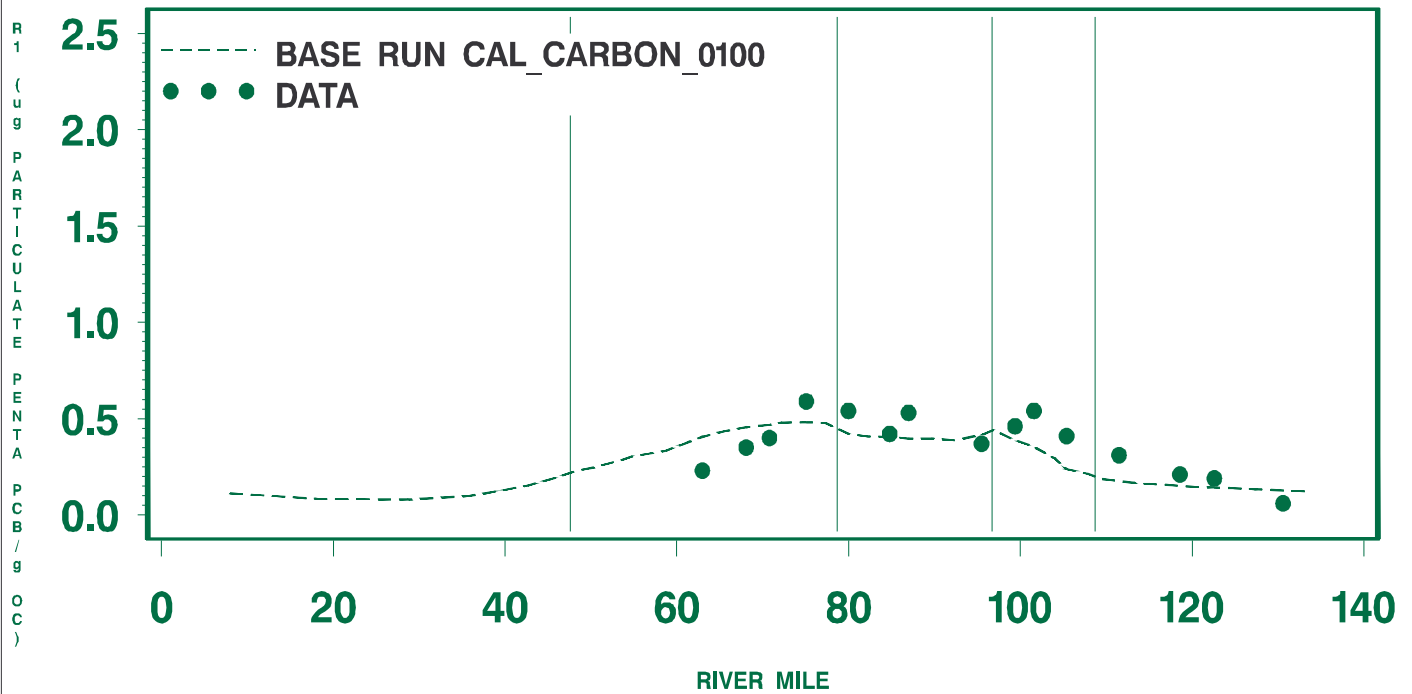
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CALIBRATION RUN ON R1 - WC R1 ON 3-10-03



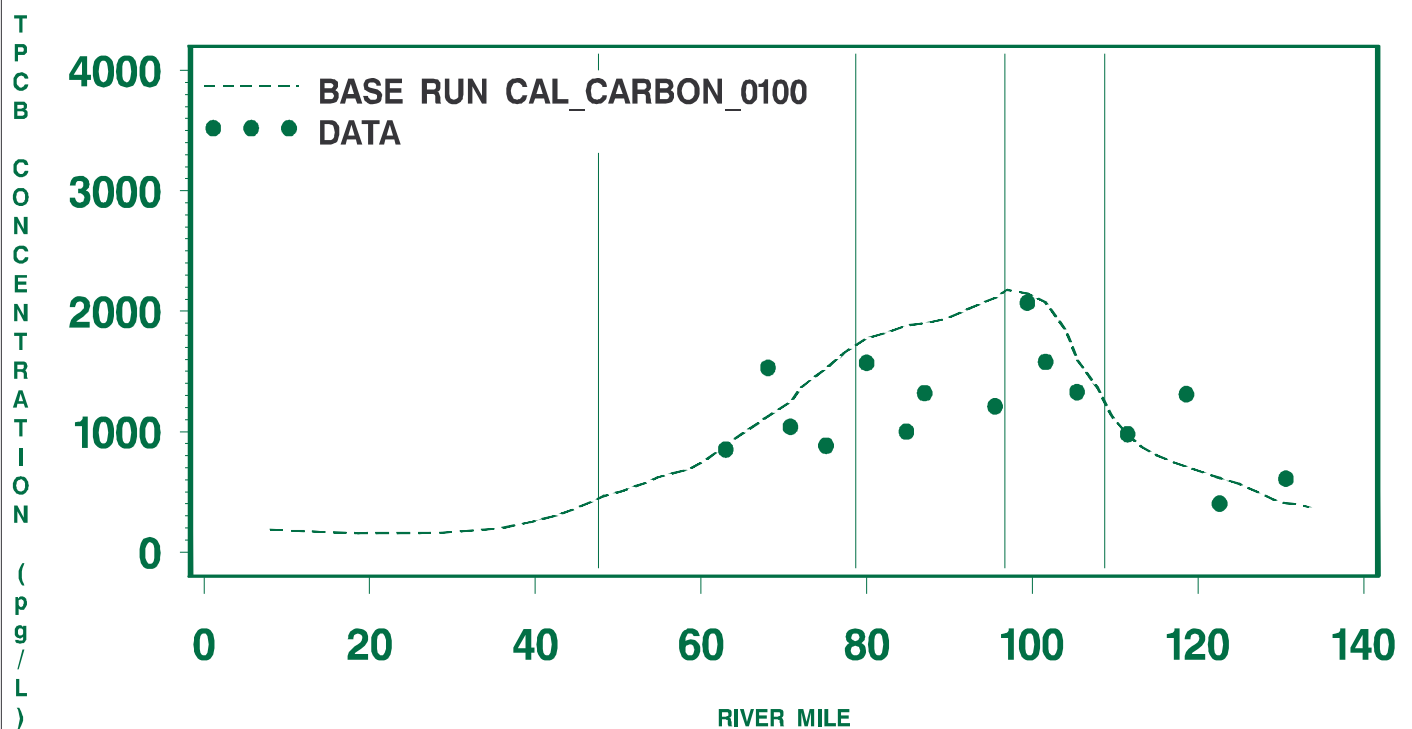
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CALIBRATION RUN ON R1 - WC R1 ON 3-19-03



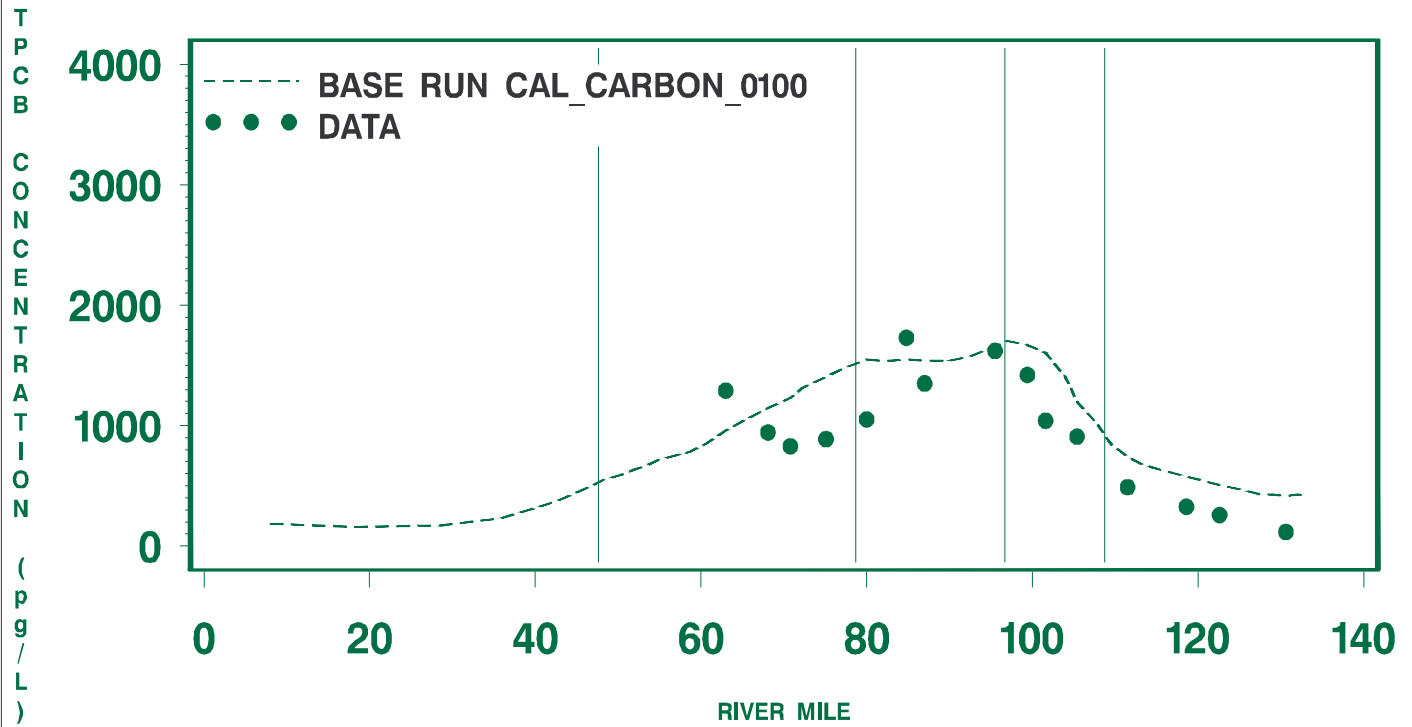
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CALIBRATION RUN ON TPCB - WC TPCB ON 3-15-02



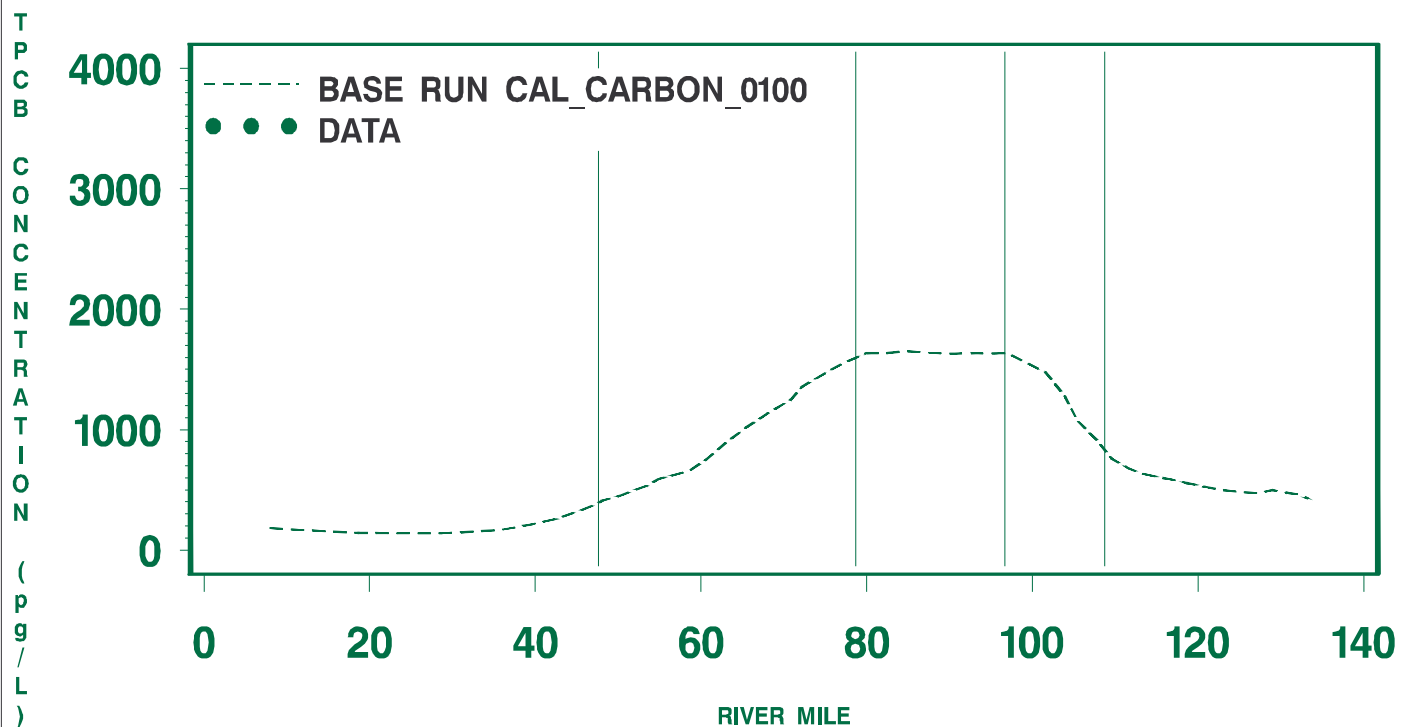
TPCB= TOTAL PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON TPCB - WC TPCB ON 4-11-02



TPCB= TOTAL PENTA PCB  
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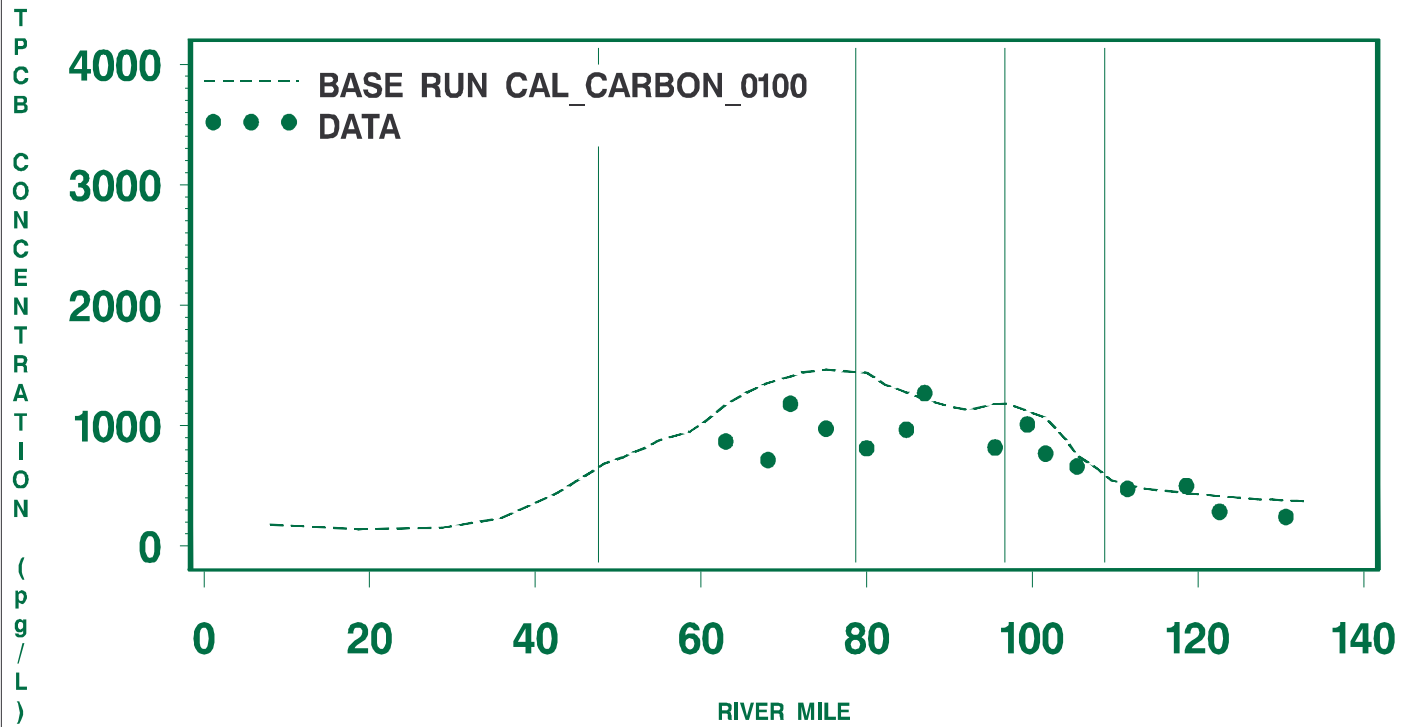
CALIBRATION RUN ON TPCB - WC TPCB ON 4-22-02



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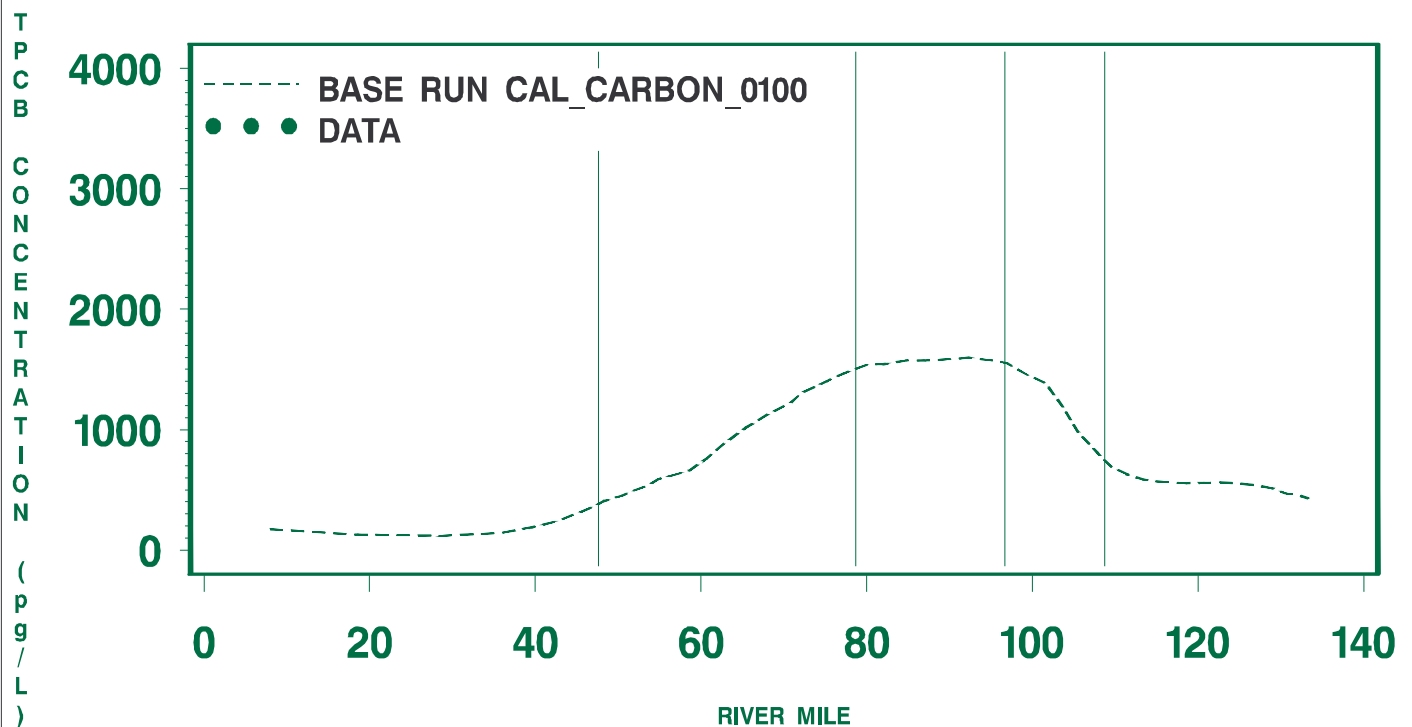


CALIBRATION RUN ON TPCB - WC TPCB ON 5-06-02



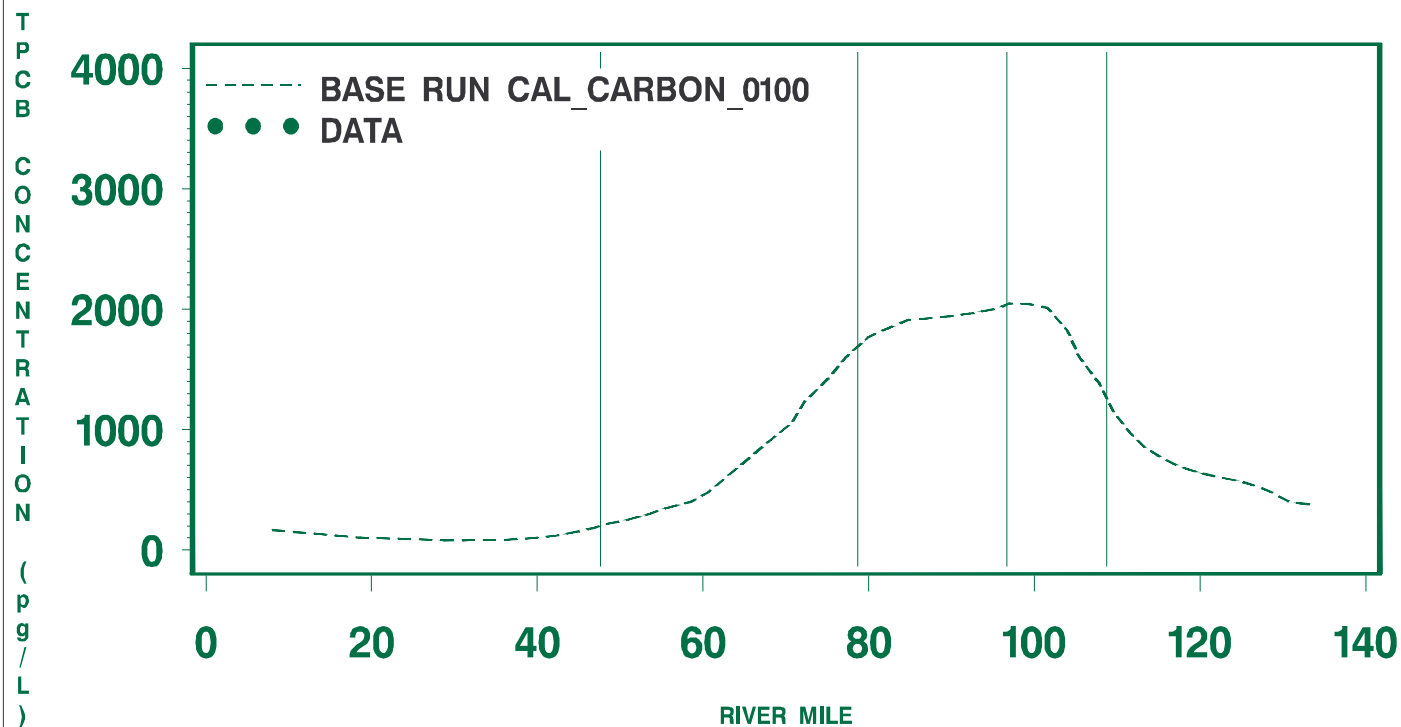
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CALIBRATION RUN ON TPCB - WC TPCB ON 6-19-02



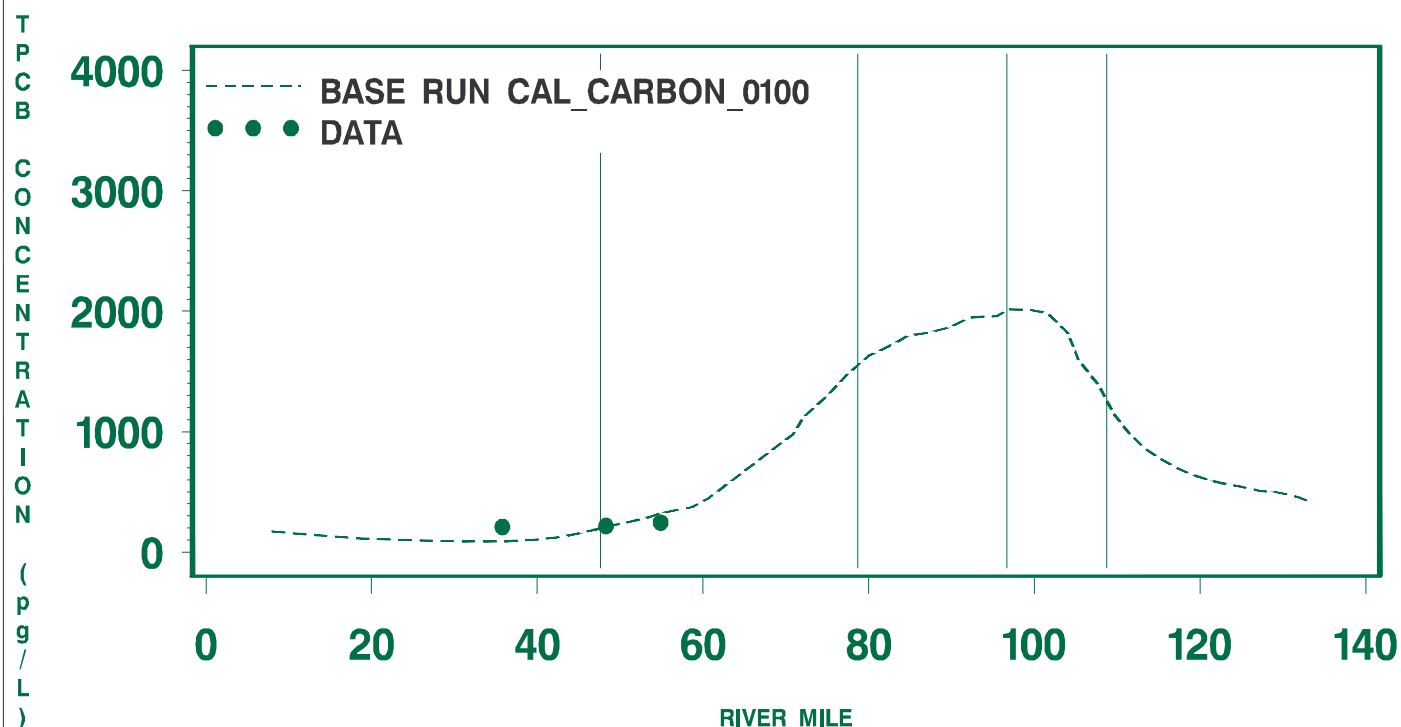
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CALIBRATION RUN ON TPCB - WC TPCB ON 08-05-02



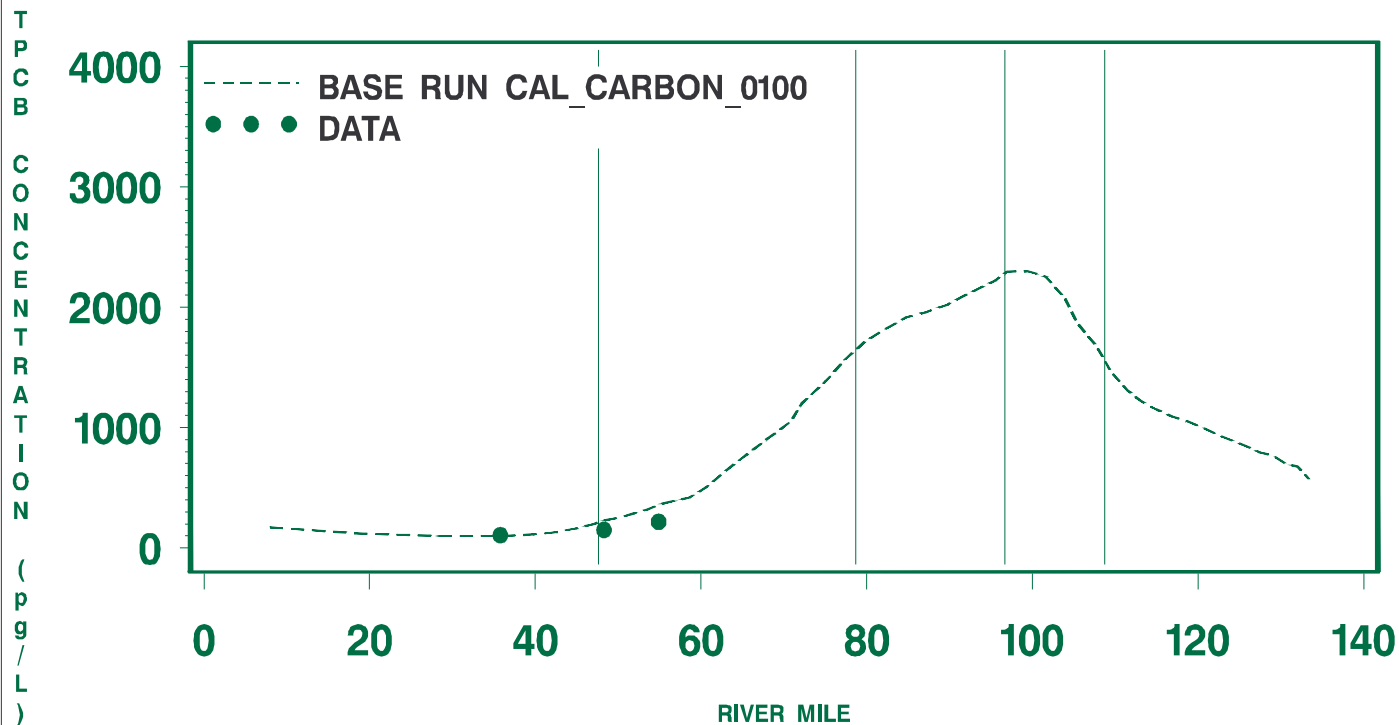
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CALIBRATION RUN ON TPCB - WC TPCB ON 08-19-02



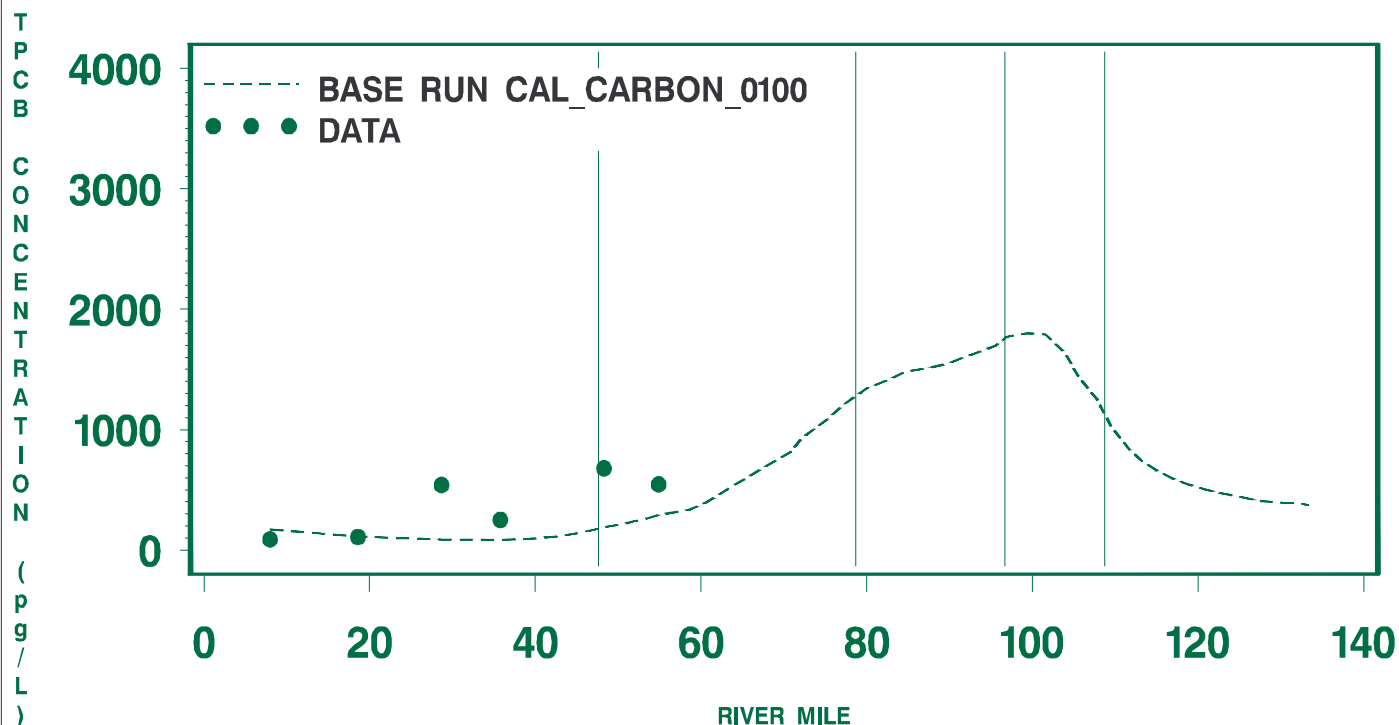
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CALIBRATION RUN ON TPCB - WC TPCB ON 09-03-02



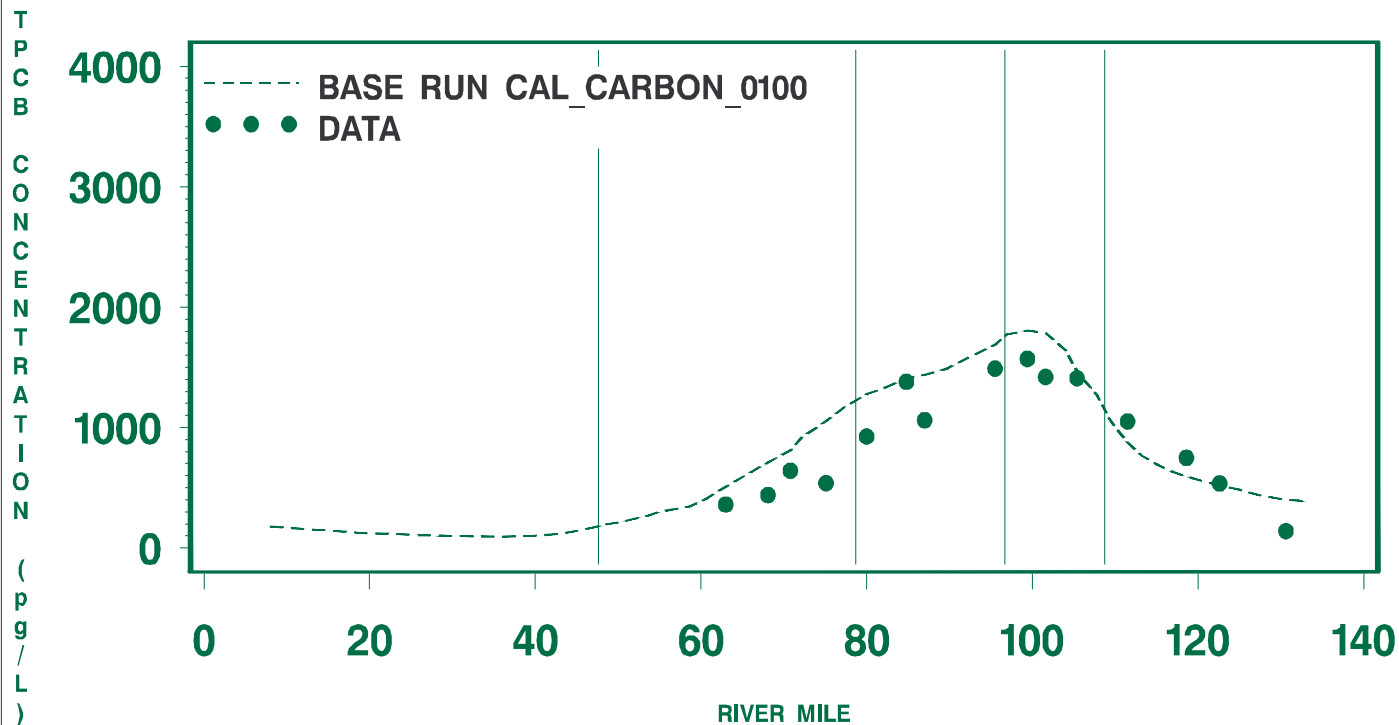
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CALIBRATION RUN ON TPCB - WC TPCB ON 09-23-02



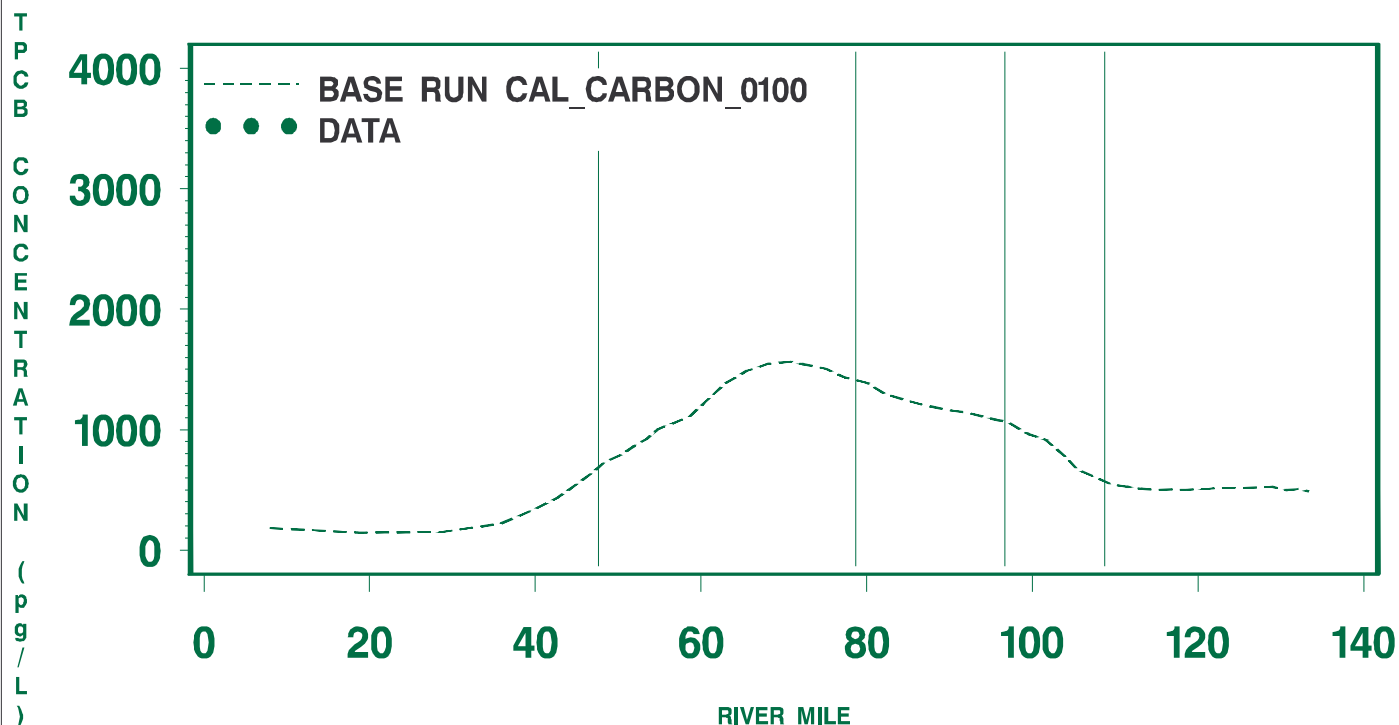
TPCB= TOTAL PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON TPCB - WC TPCB ON 10-08-02



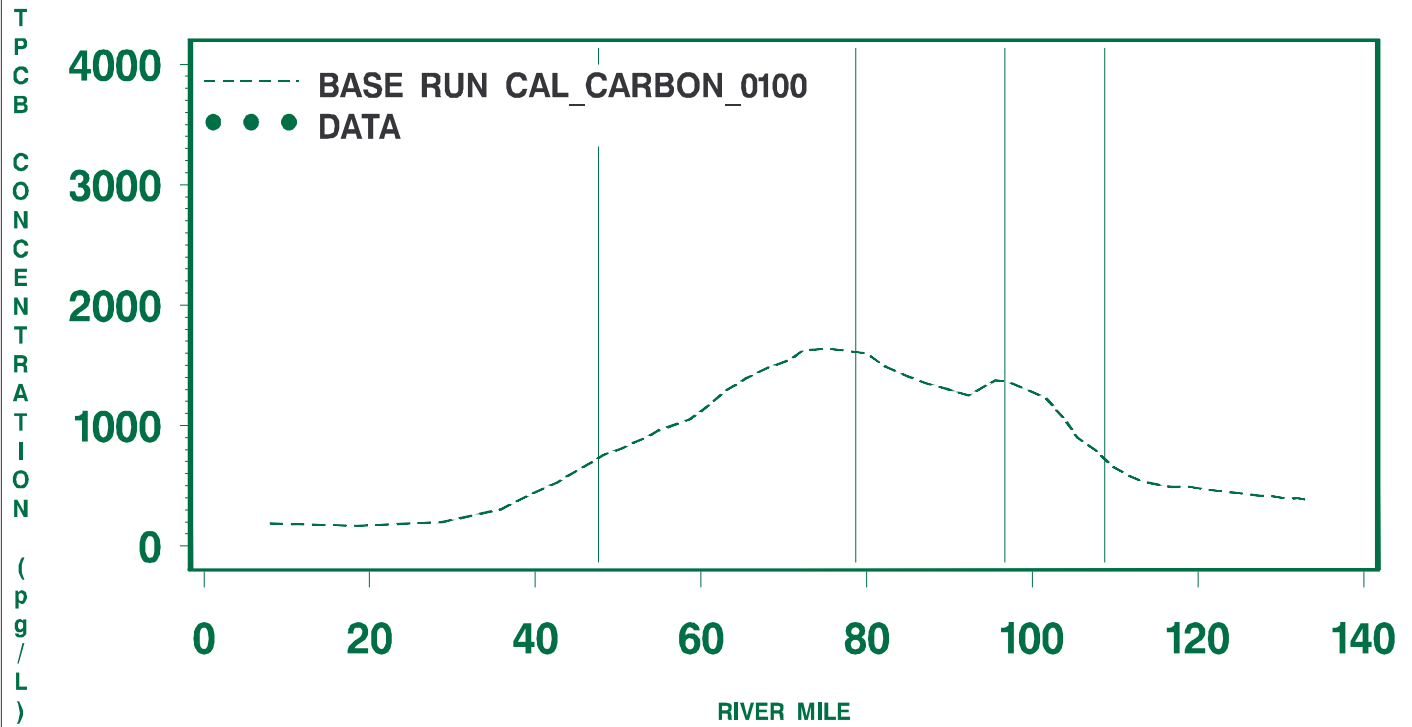
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CALIBRATION RUN ON TPCB - WC TPCB ON 11-21-02



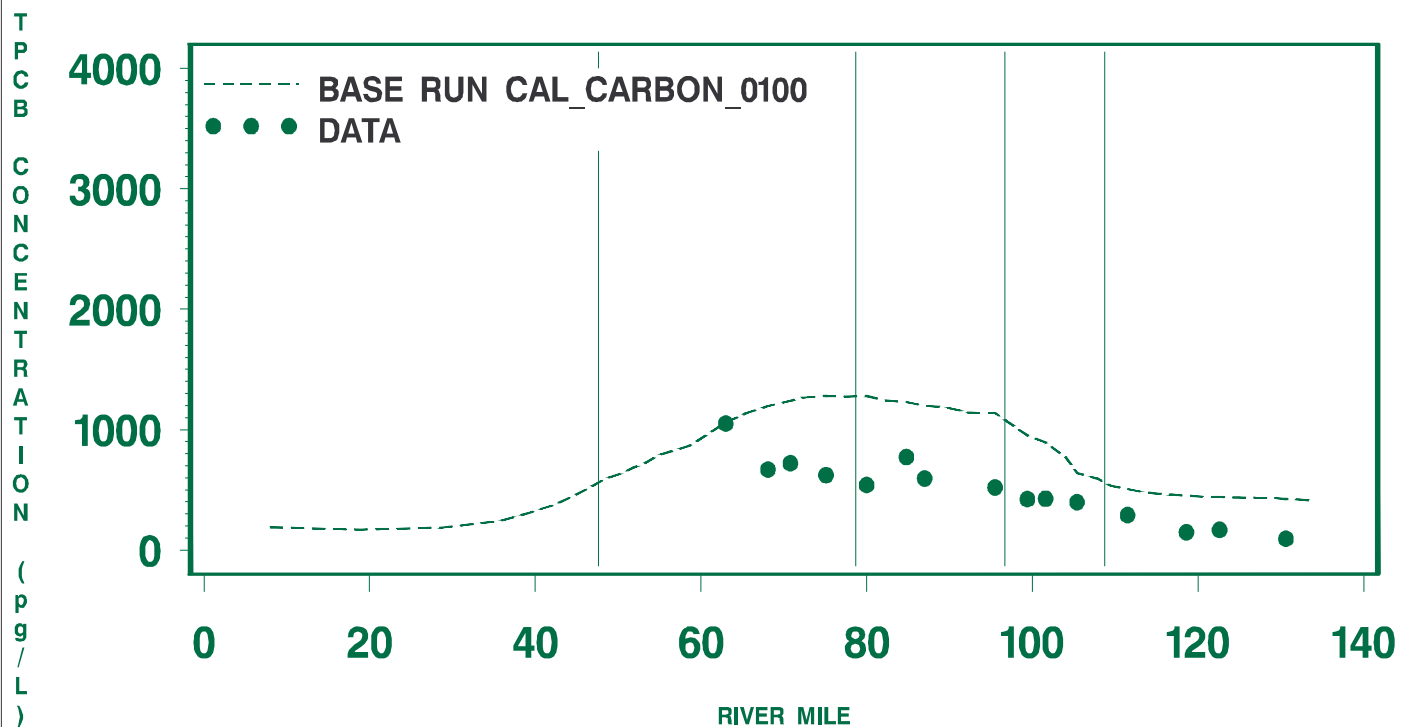
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CALIBRATION RUN ON TPCB - WC TPCB ON 3-10-03



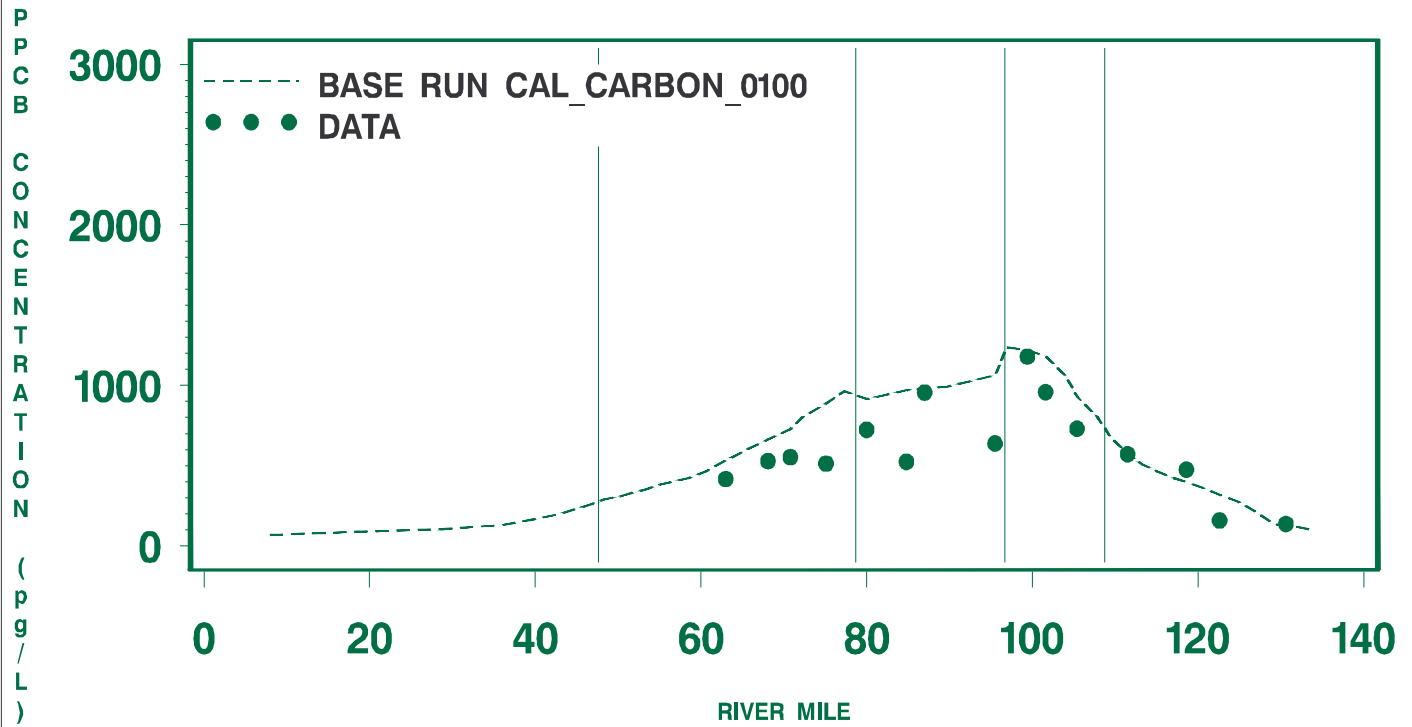
TPCB= TOTAL PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON TPCB - WC TPCB ON 3-19-03



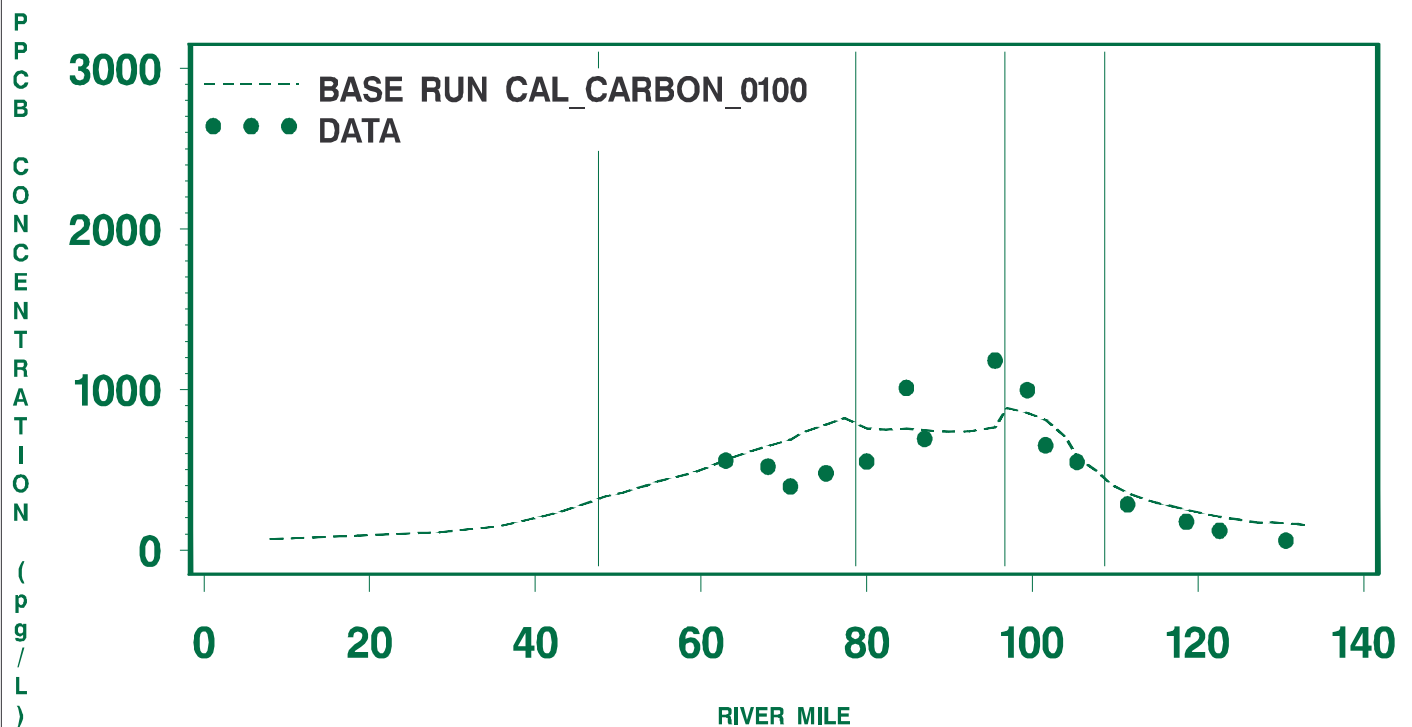
TPCB= TOTAL PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON PPCB - WC PPCB ON 3-15-02



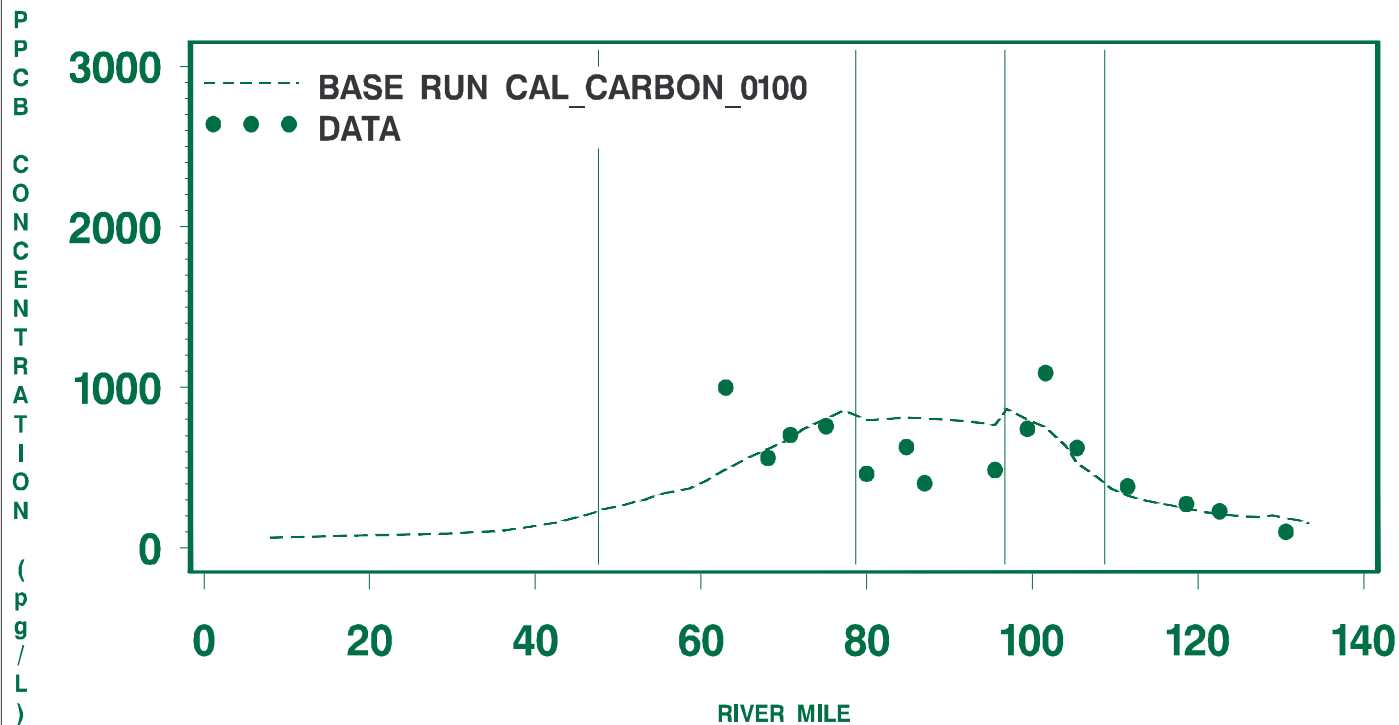
PPCB= PARTICULATE PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON PPCB - WC PPCB ON 4-11-02



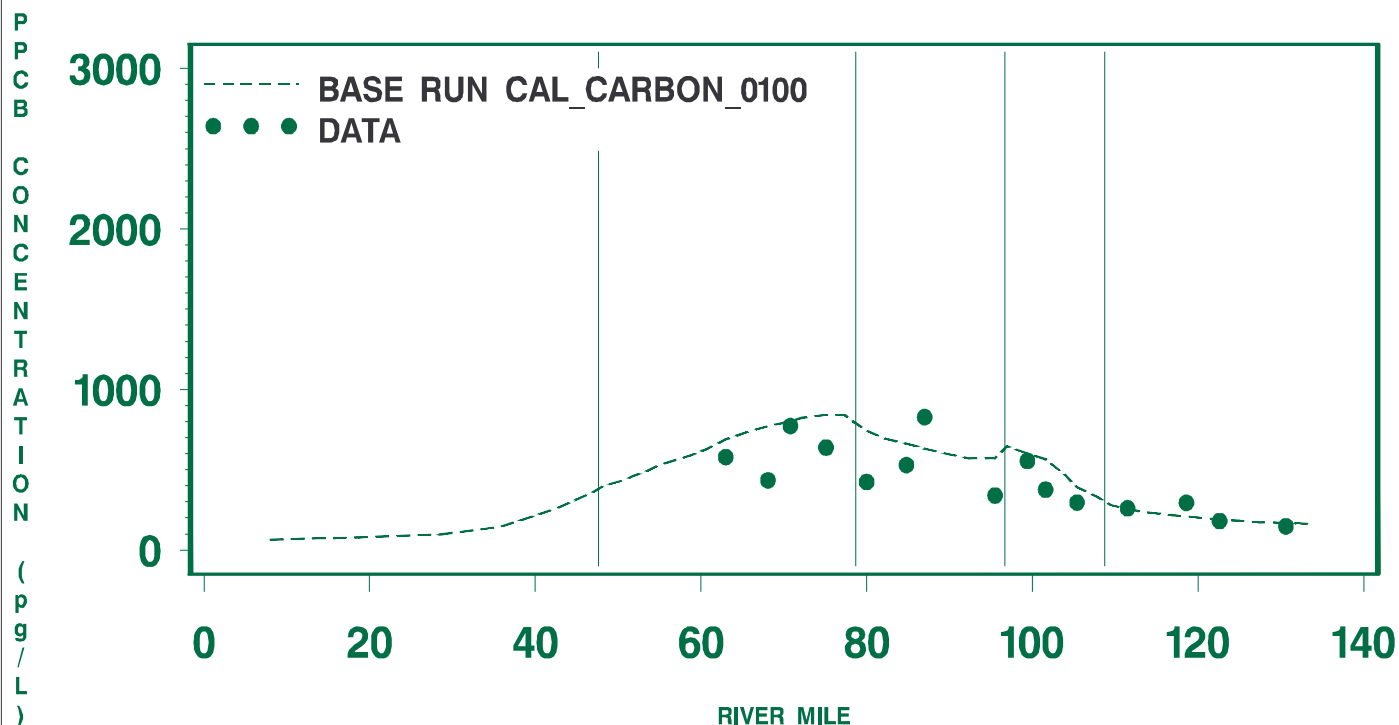
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CALIBRATION RUN ON PPCB - WC PPCB ON 4-22-02



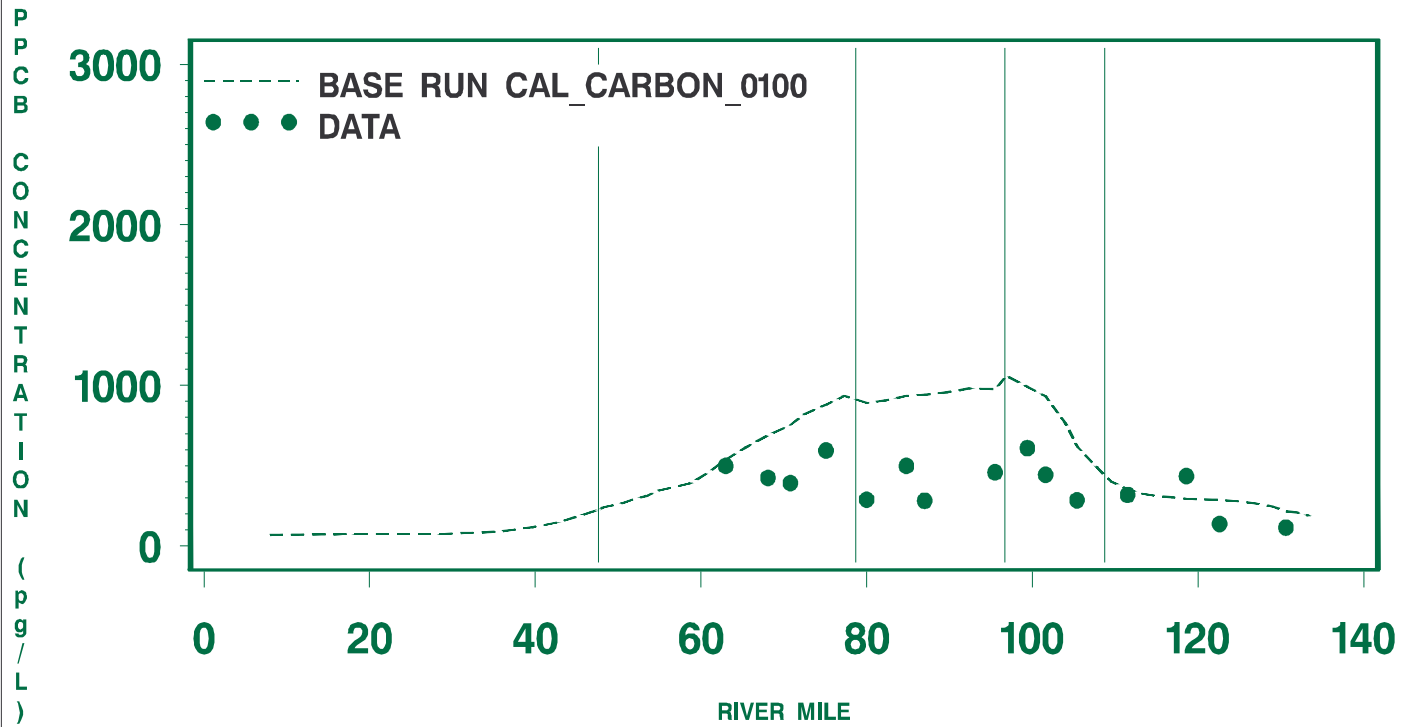
PPCB= PARTICULATE PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON PPCB - WC PPCB ON 5-06-02



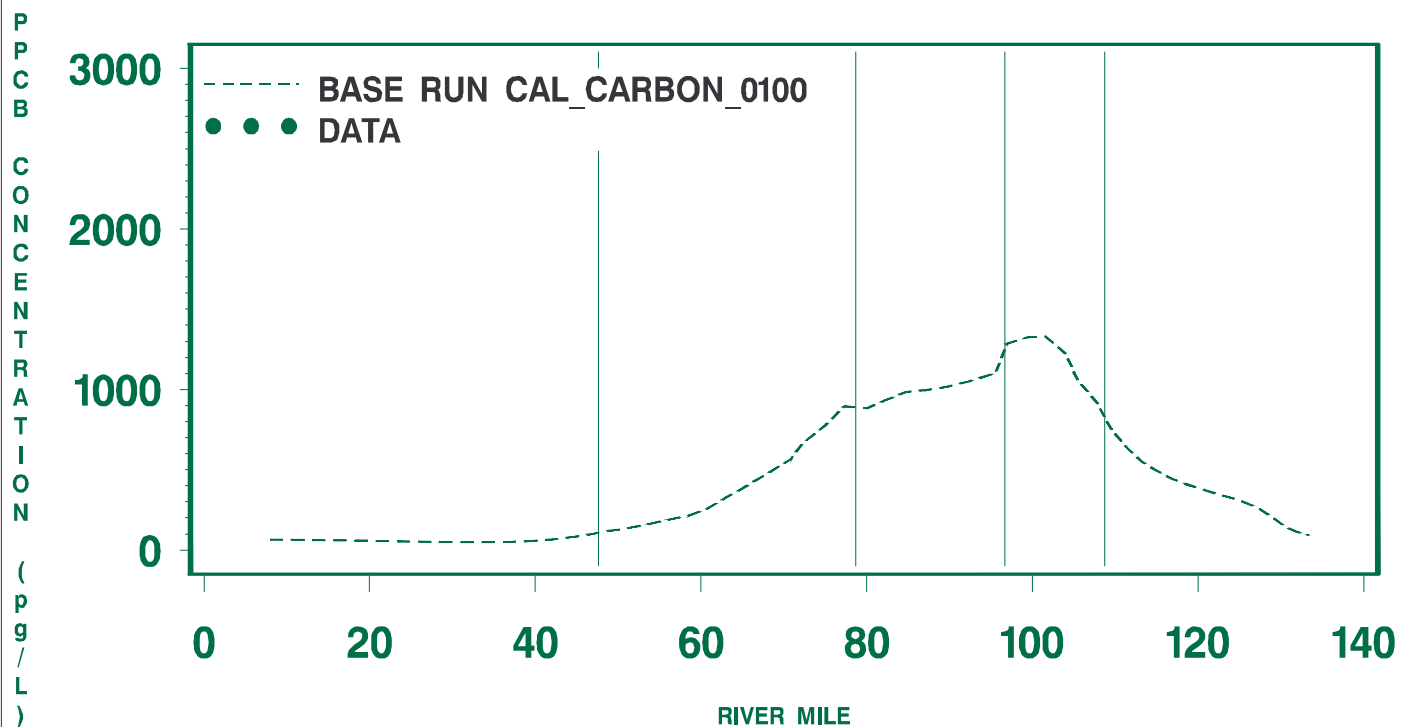
PPCB= PARTICULATE PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON PPCB - WC PPCB ON 6-19-02



PPCB= PARTICULATE PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

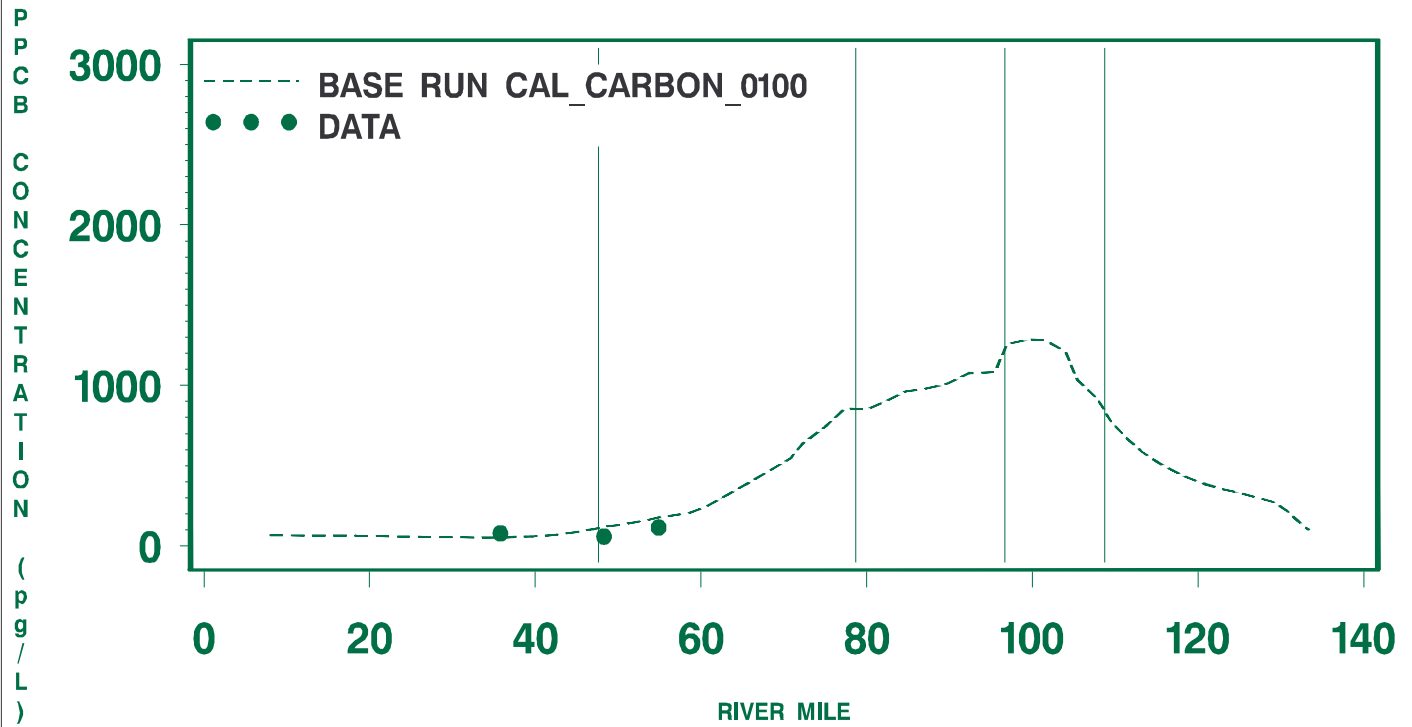
CALIBRATION RUN ON PPCB - WC PPCB ON 08-05-02



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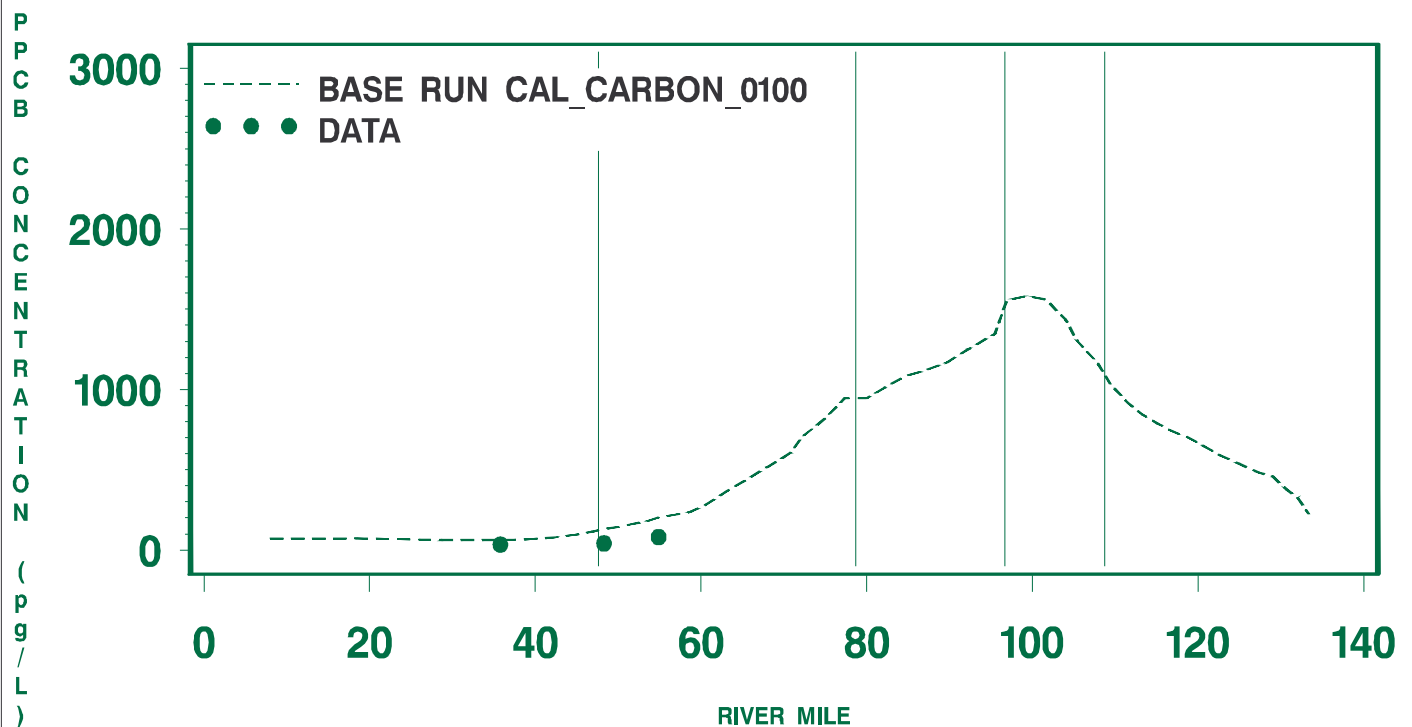


CALIBRATION RUN ON PPCB - WC PPCB ON 08-19-02



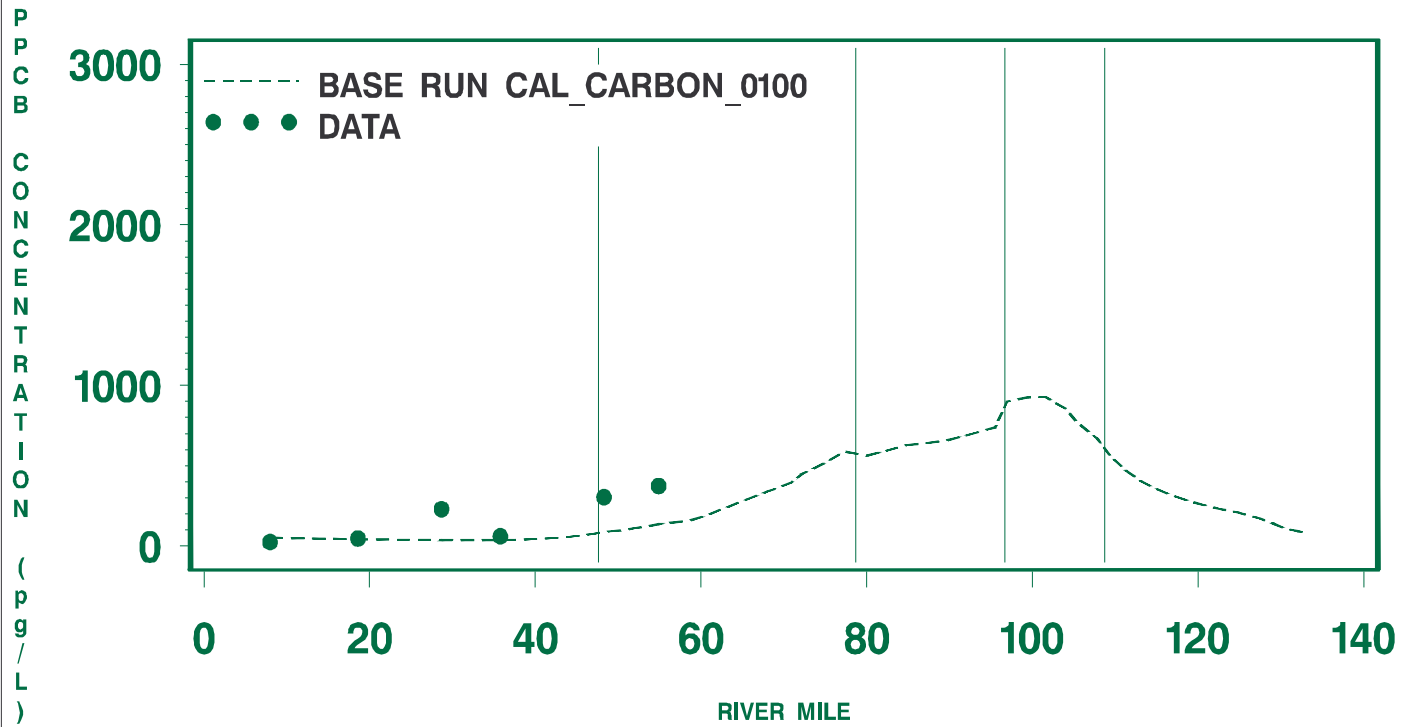
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CALIBRATION RUN ON PPCB - WC PPCB ON 09-03-02



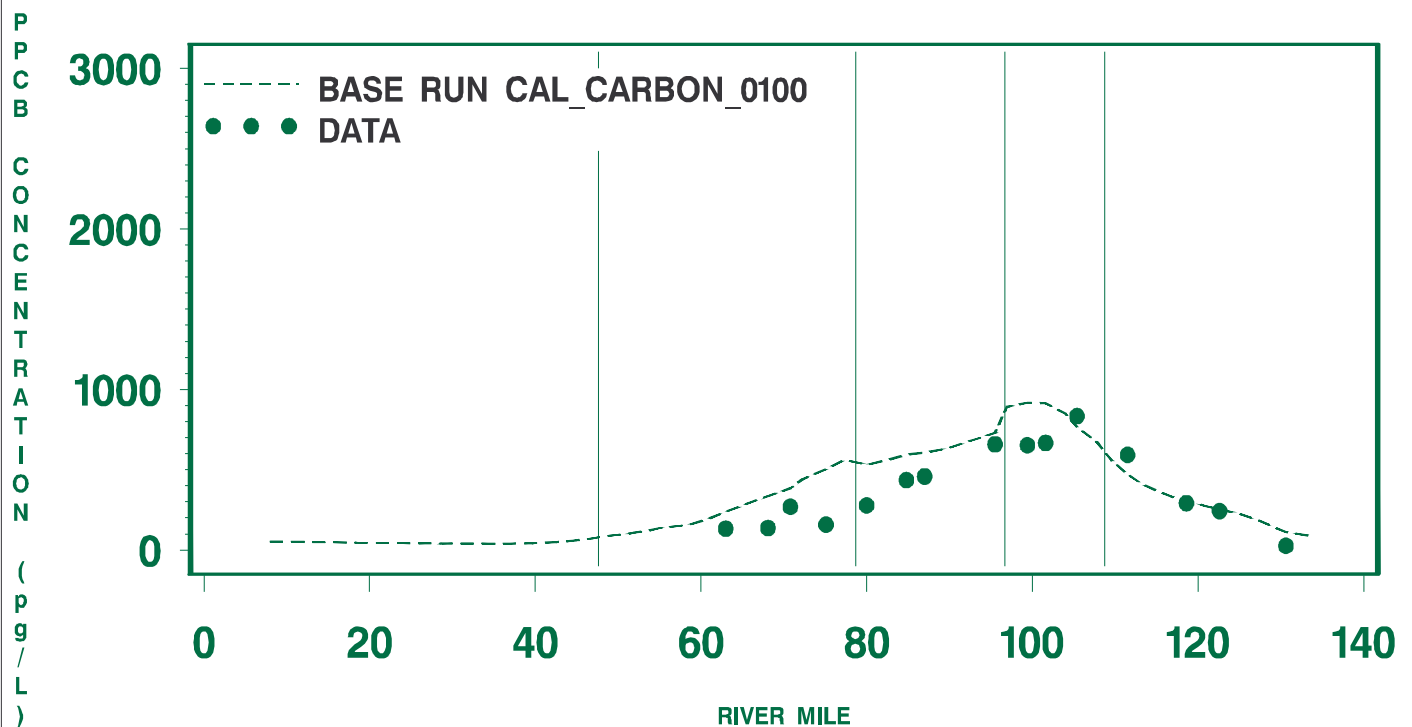
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CALIBRATION RUN ON PPCB - WC PPCB ON 09-23-02



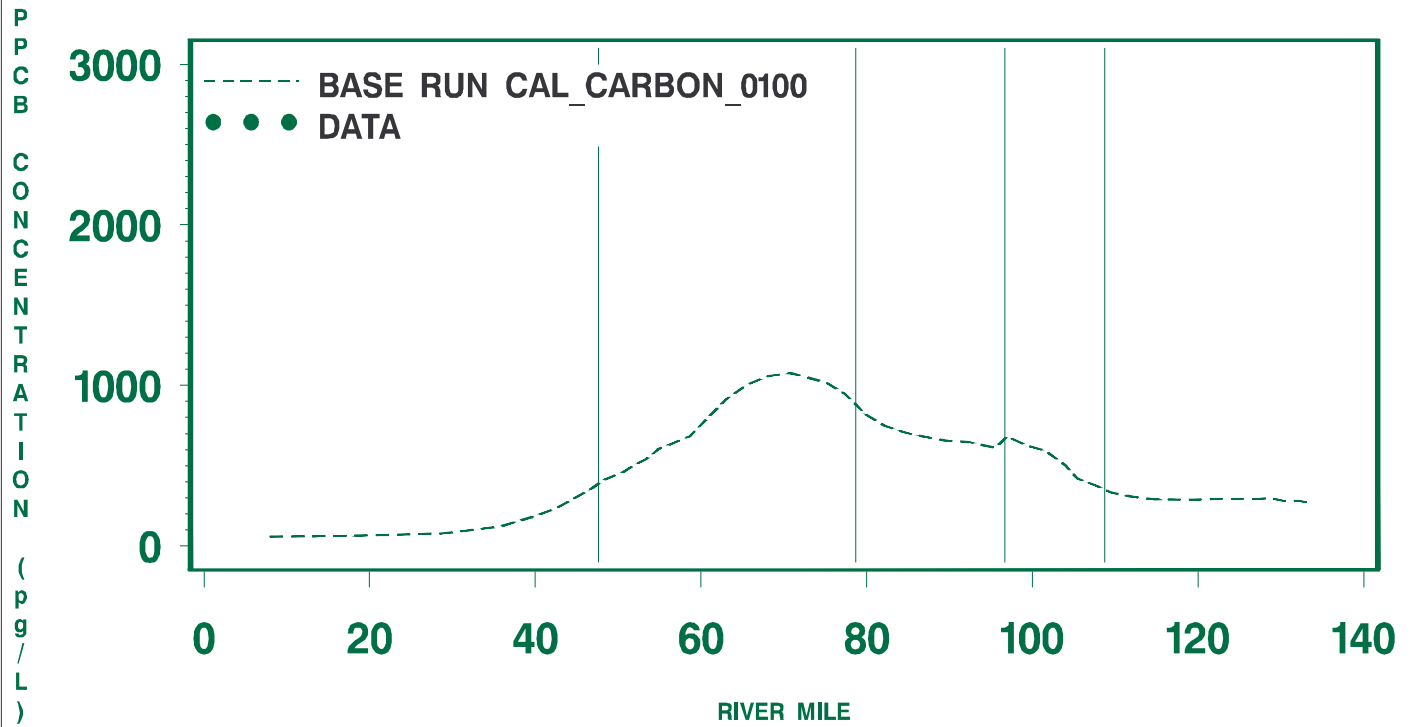
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CALIBRATION RUN ON PPCB - WC PPCB ON 10-08-02



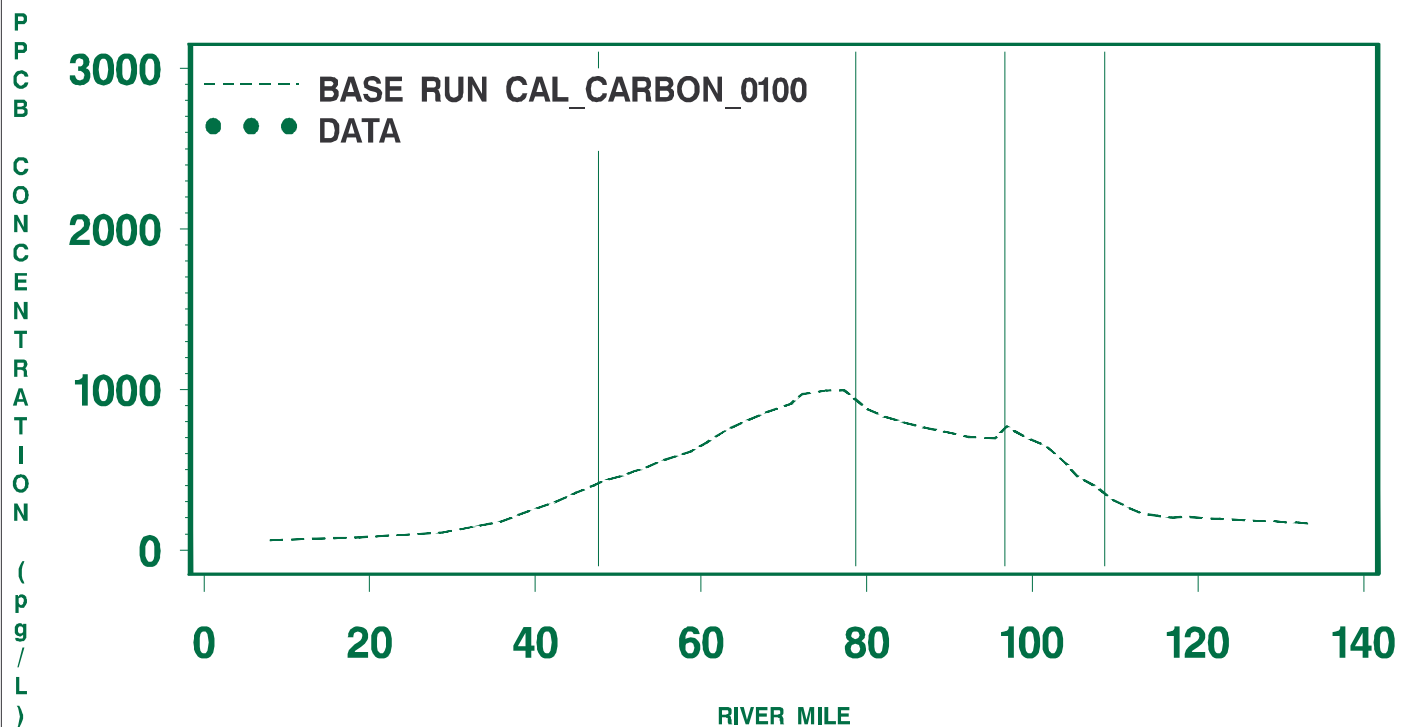
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CALIBRATION RUN ON PPCB - WC PPCB ON 11-21-02



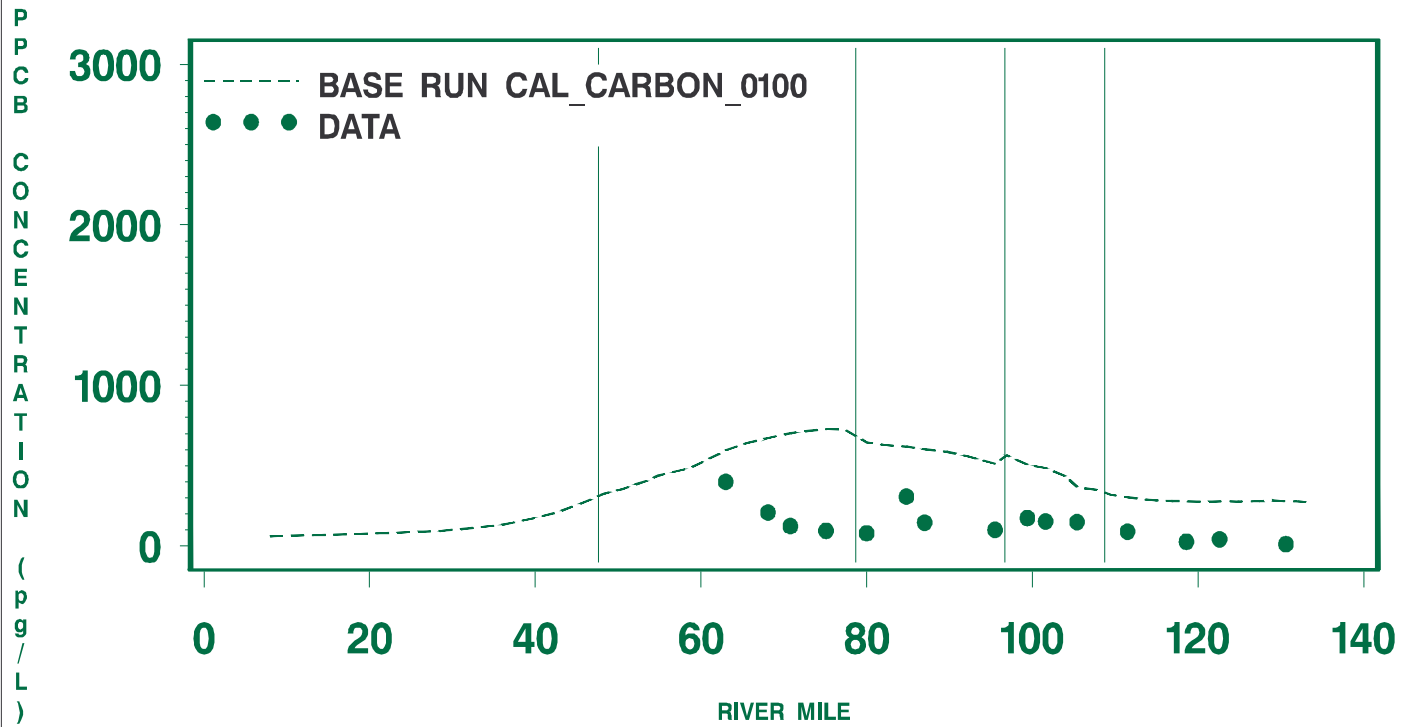
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31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON PPCB - WC PPCB ON 3-10-03



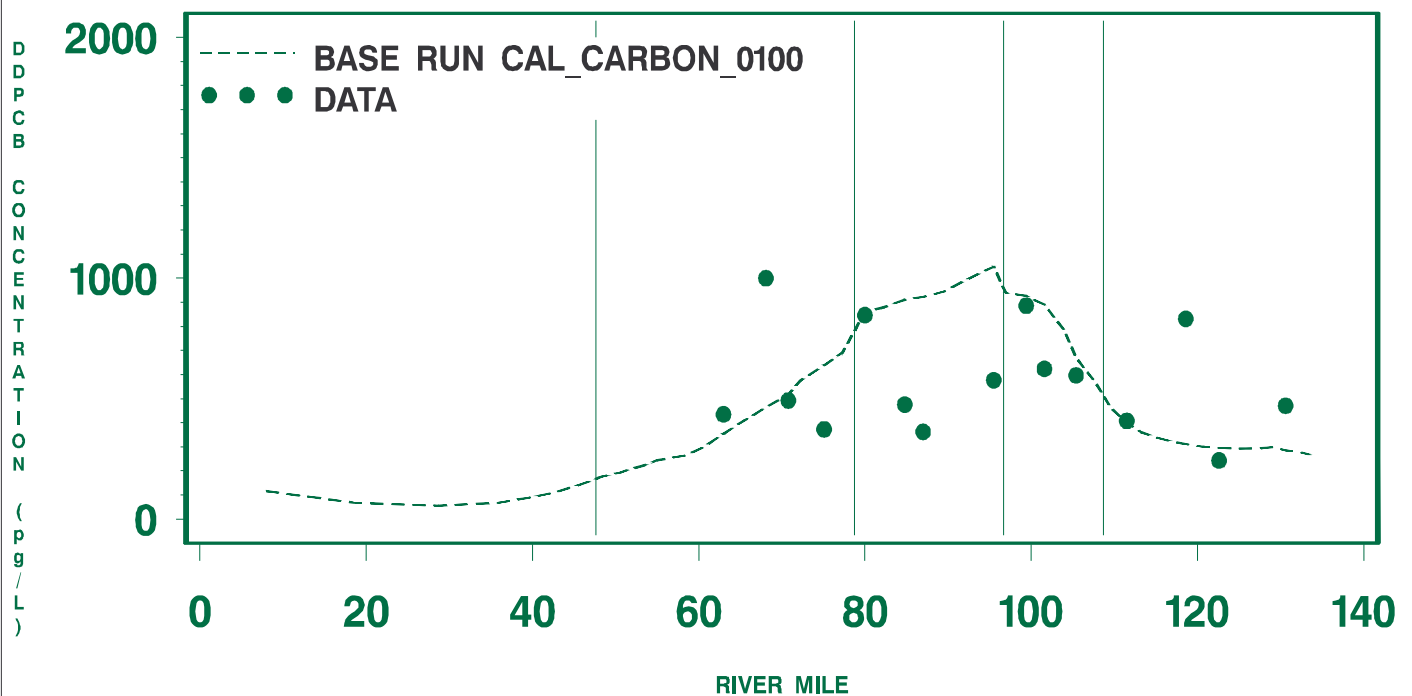
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CALIBRATION RUN ON PPCB - WC PPCB ON 3-19-03



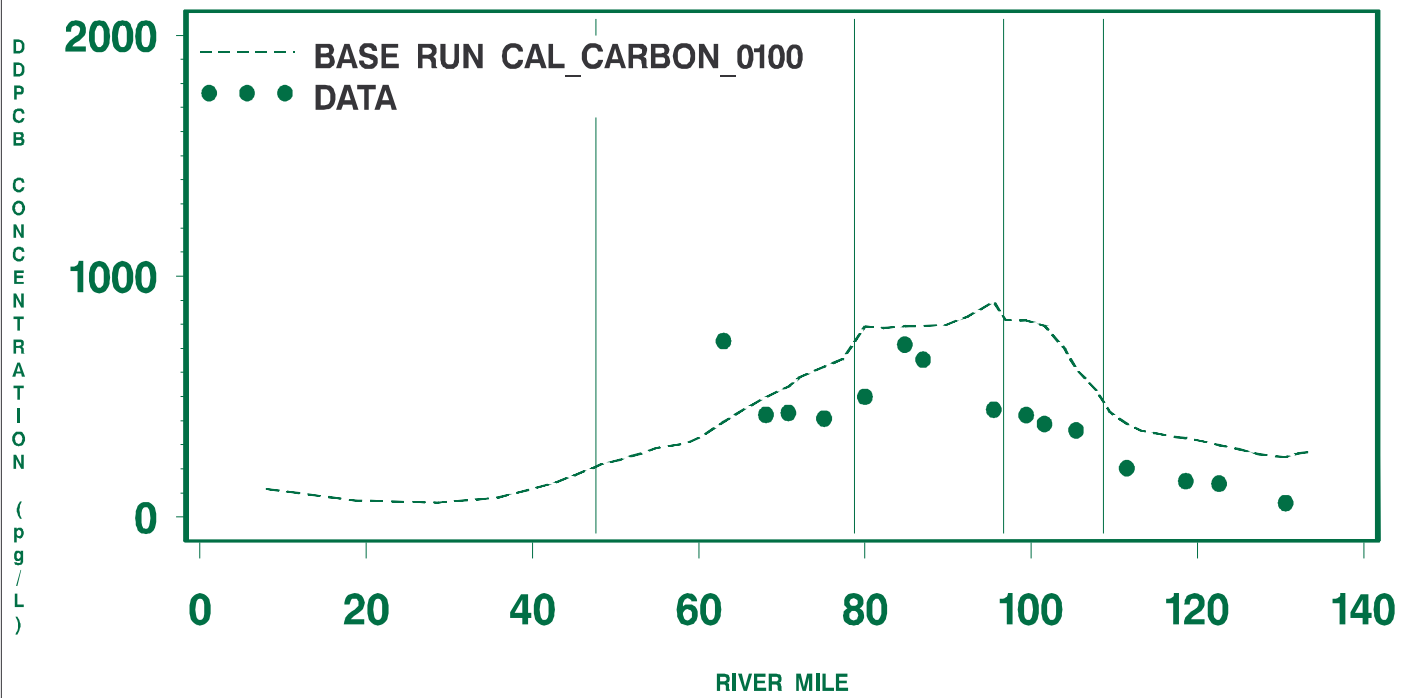
PPCB= PARTICULATE PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON DDPCB - WC DDPCB ON 3-15-02



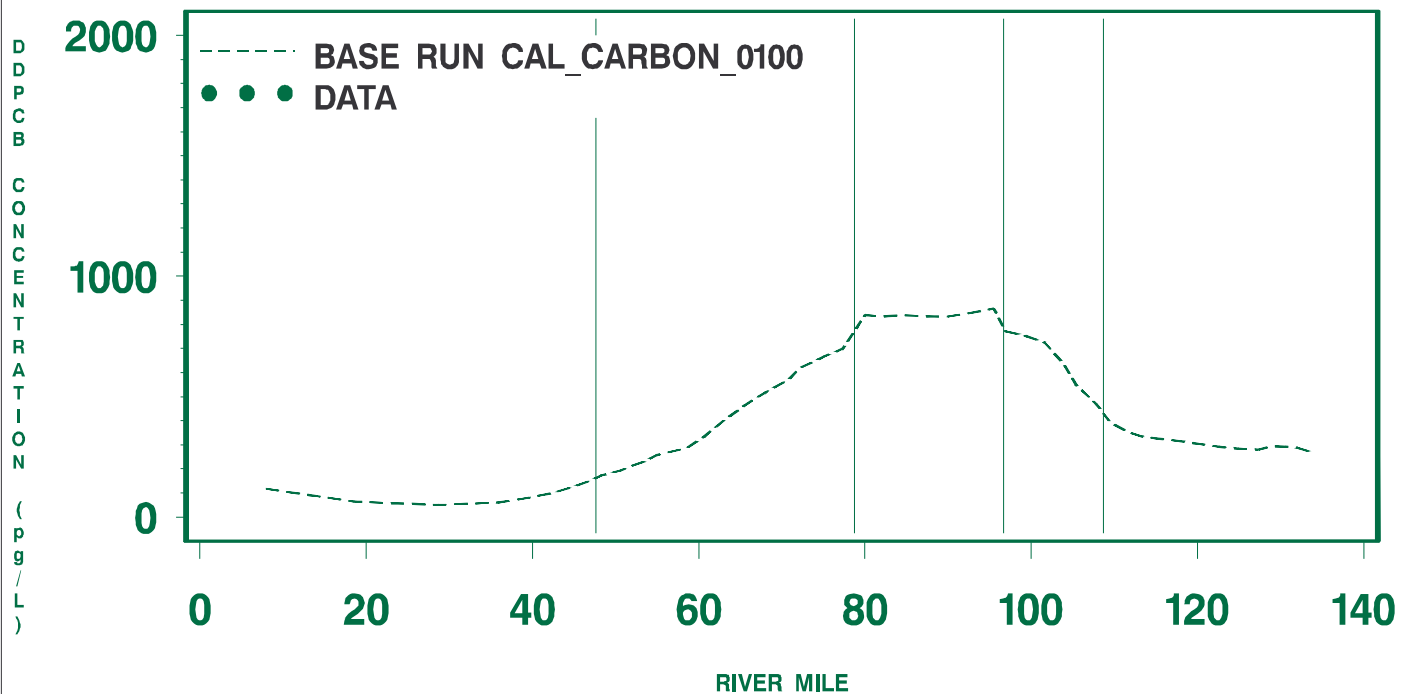
DDPCB= TRUE DISSOLVED + DOC-BOUND PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON DDPCB - WC DDPCB ON 4-11-02



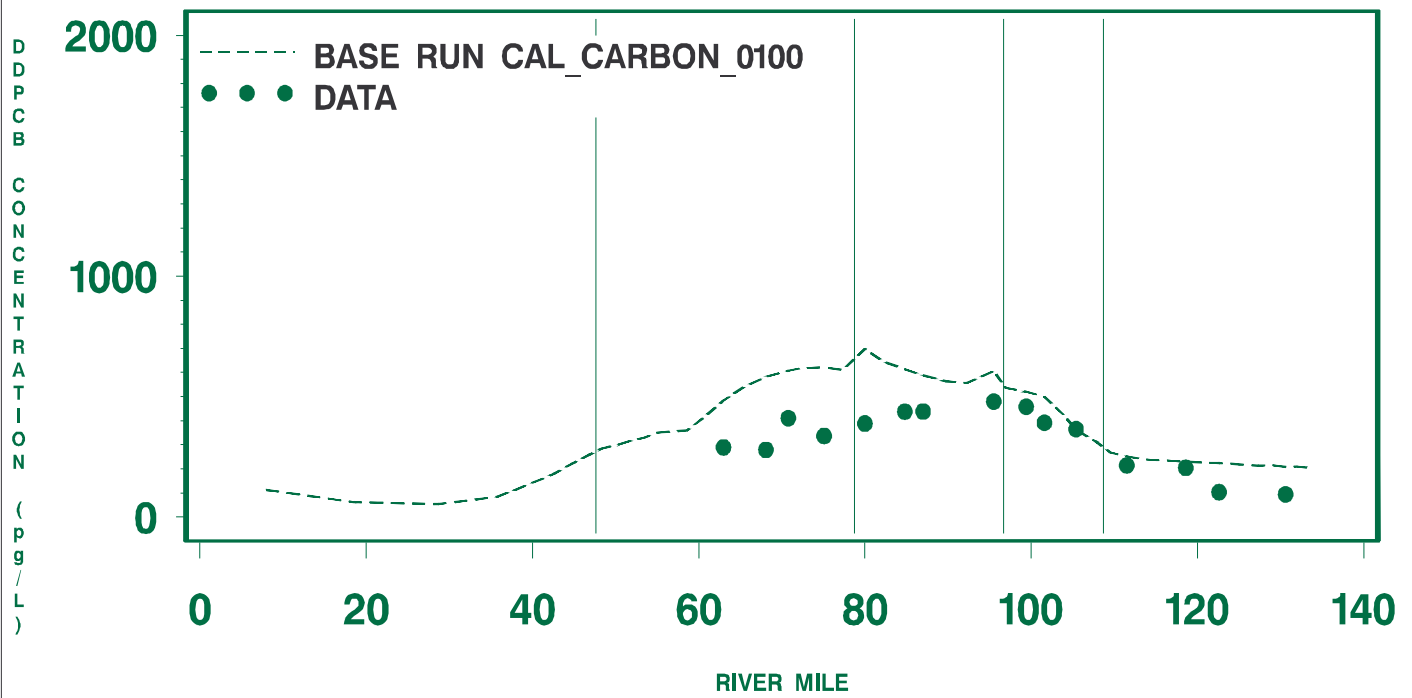
DDPCB= TRUE DISSOLVED + DOC-BOUND PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON DDPCB - WC DDPCB ON 4-22-02



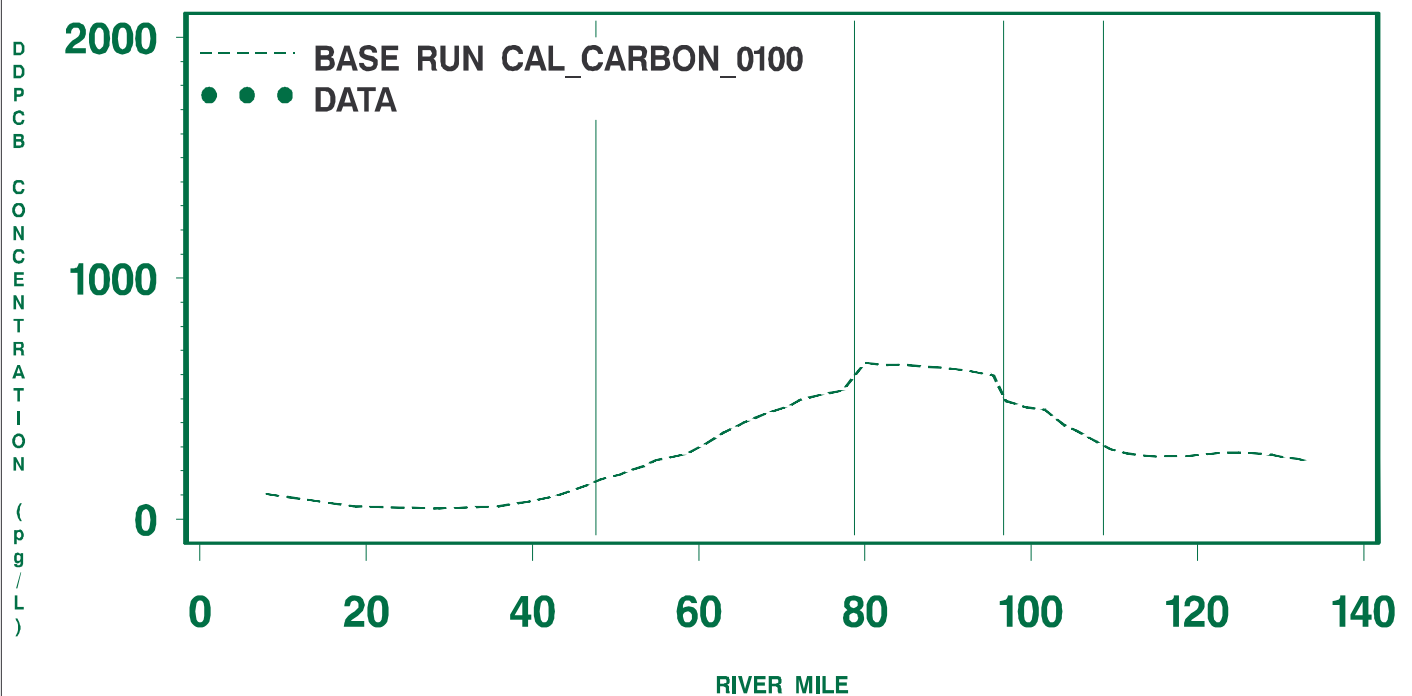
DDPCB= TRUE DISSOLVED + DOC-BOUND PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON DDPCB - WC DDPCB ON 5-06-02



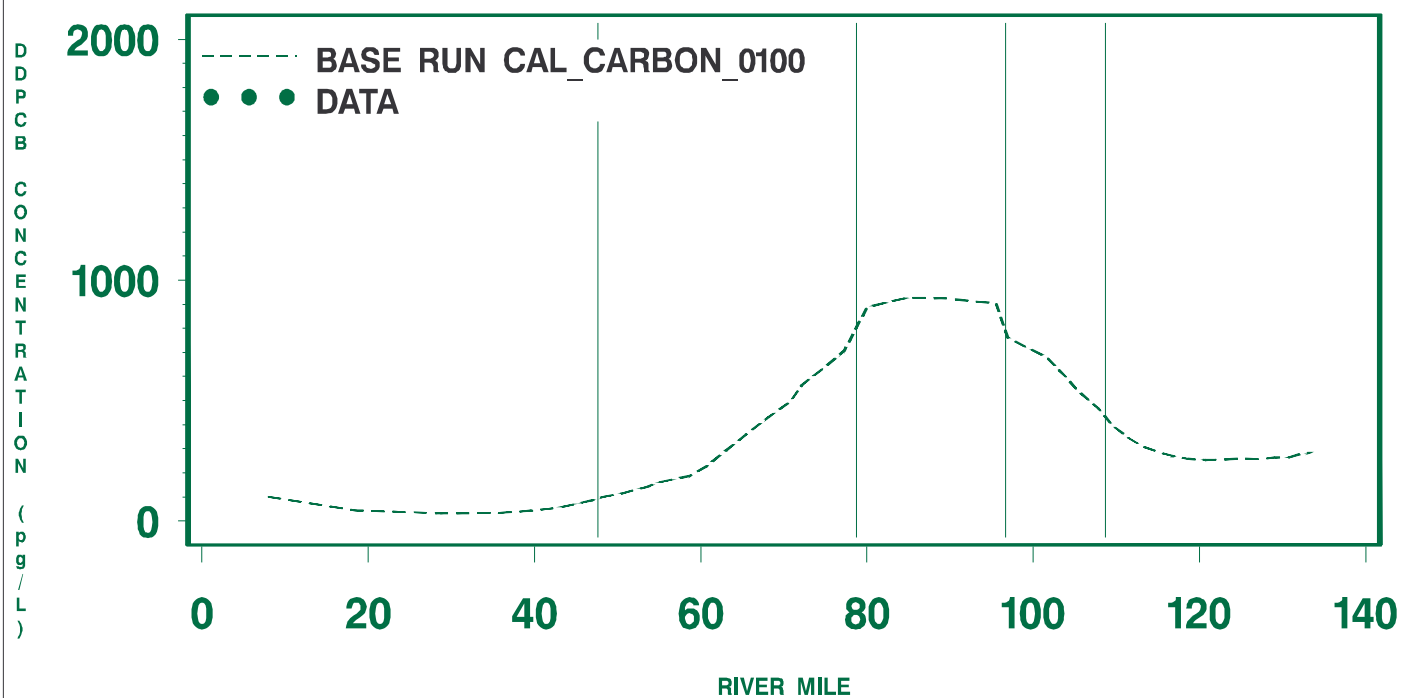
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31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON DDPCB - WC DDPCB ON 6-19-02



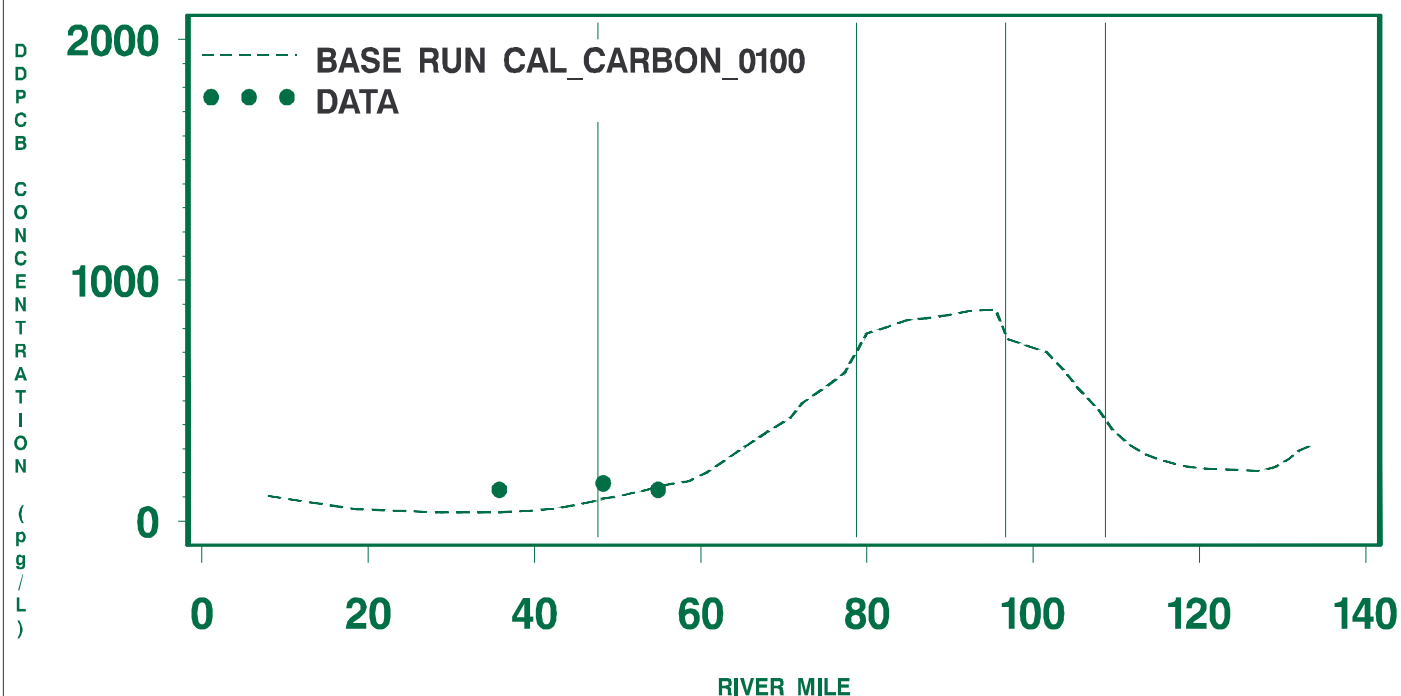
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CALIBRATION RUN ON DDPCB - WC DDPCB ON 08-05-02



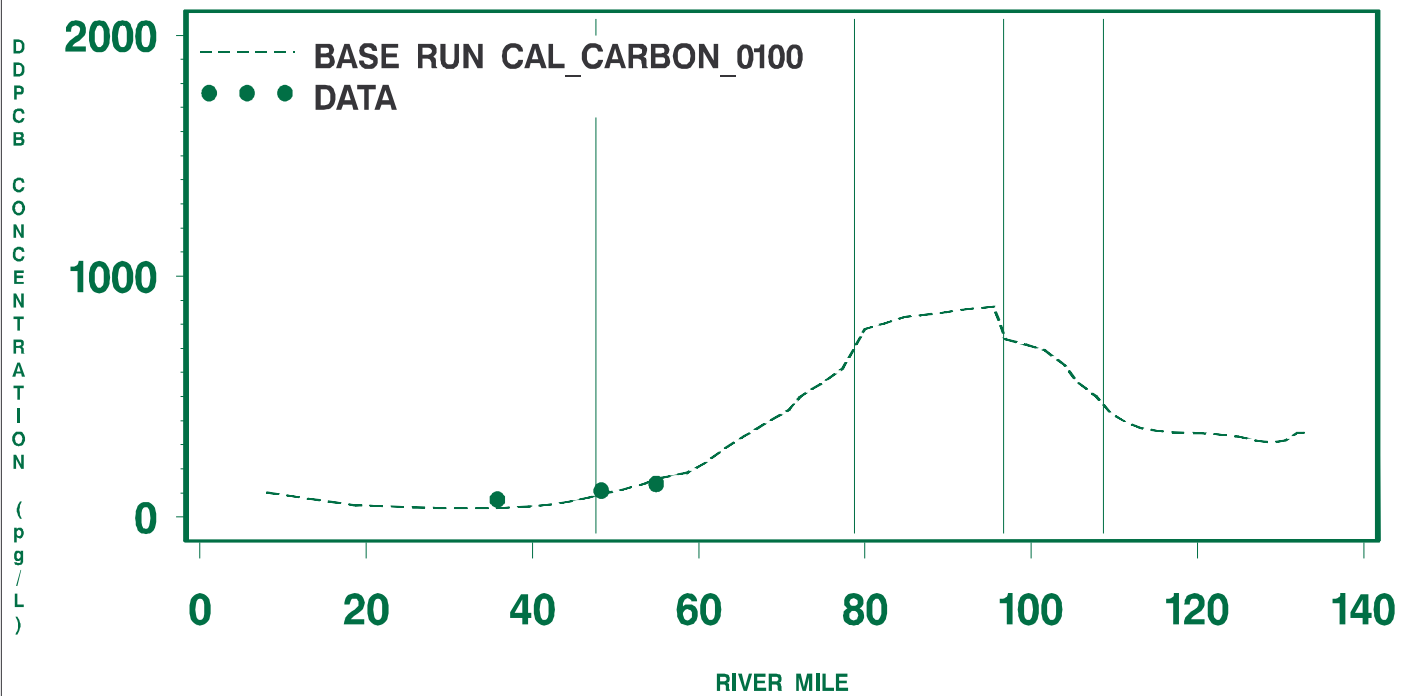
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CALIBRATION RUN ON DDPCB - WC DDPCB ON 08-19-02



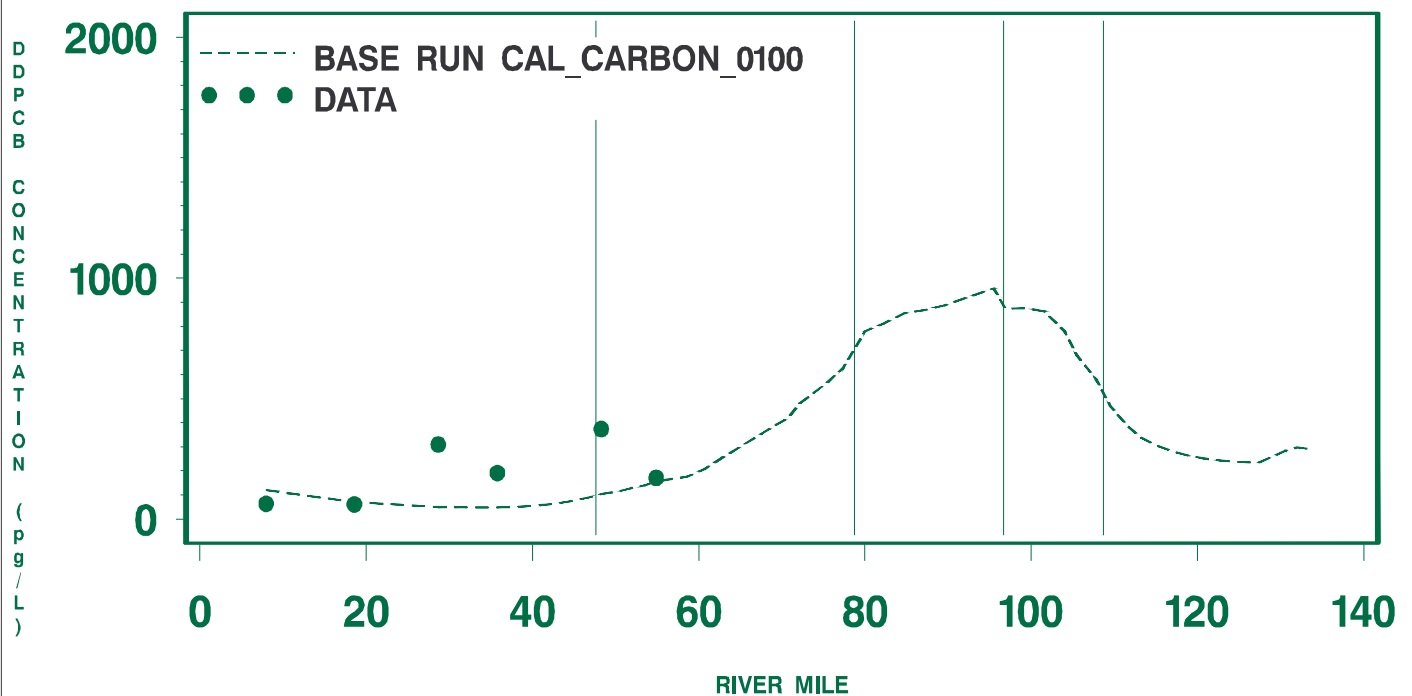
DDPCB= TRUE DISSOLVED + DOC-BOUND PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON DDPCB - WC DDPCB ON 09-03-02



DDPCB = TRUE DISSOLVED + DOC-BOUND PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

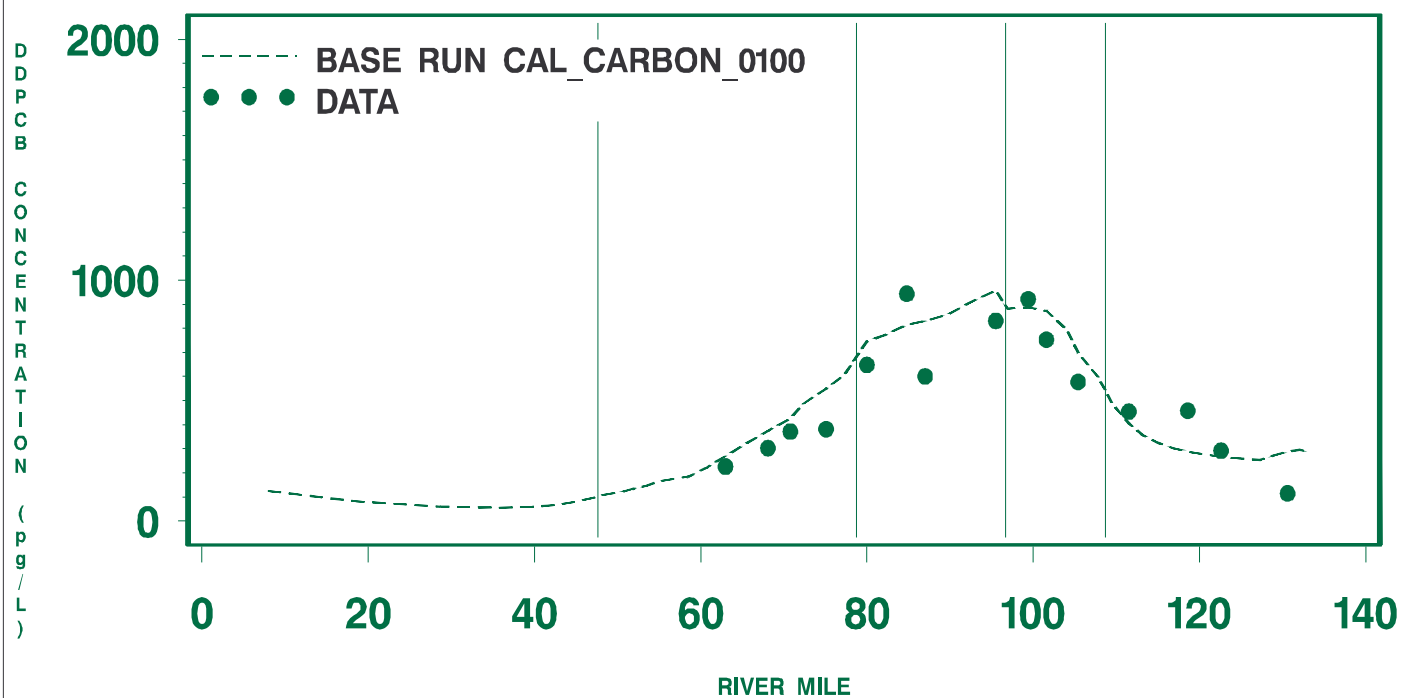
CALIBRATION RUN ON DDPCB - WC DDPCB ON 09-23-02



DDPCB = TRUE DISSOLVED + DOC-BOUND PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

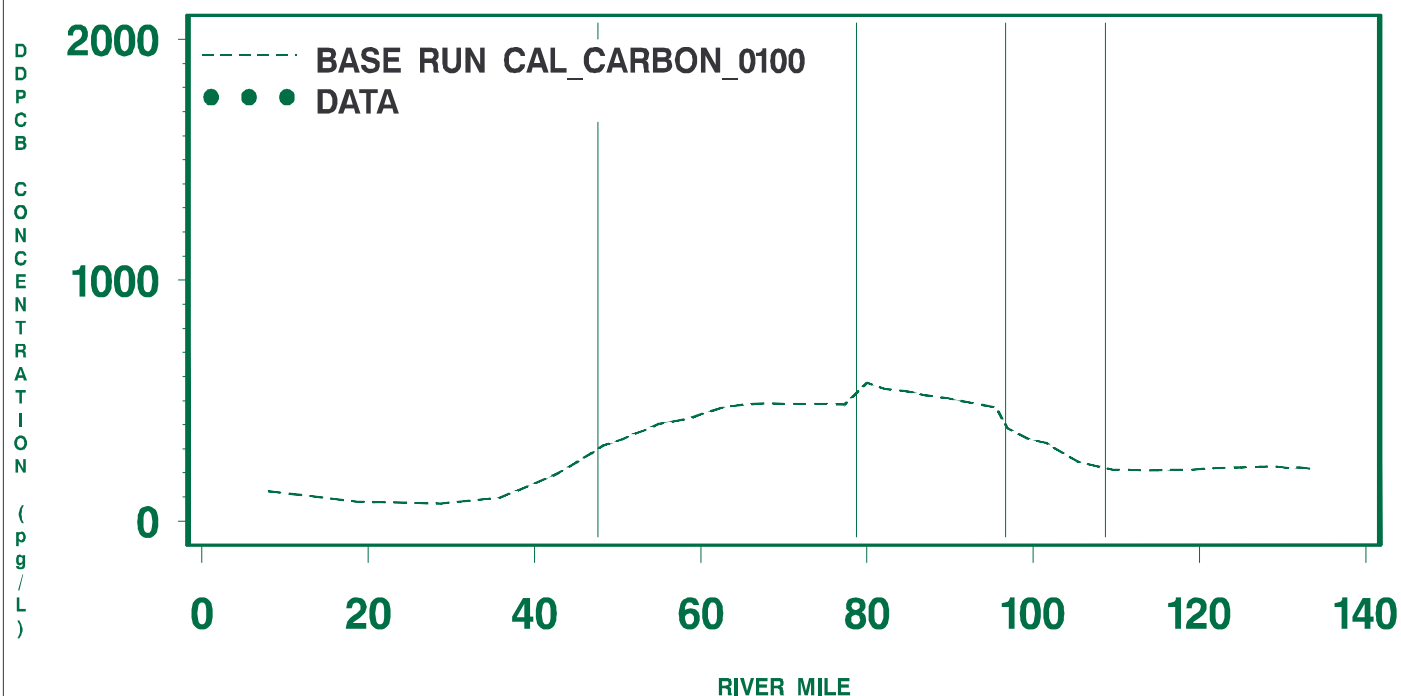


CALIBRATION RUN ON DDPCB - WC DDPCB ON 10-08-02



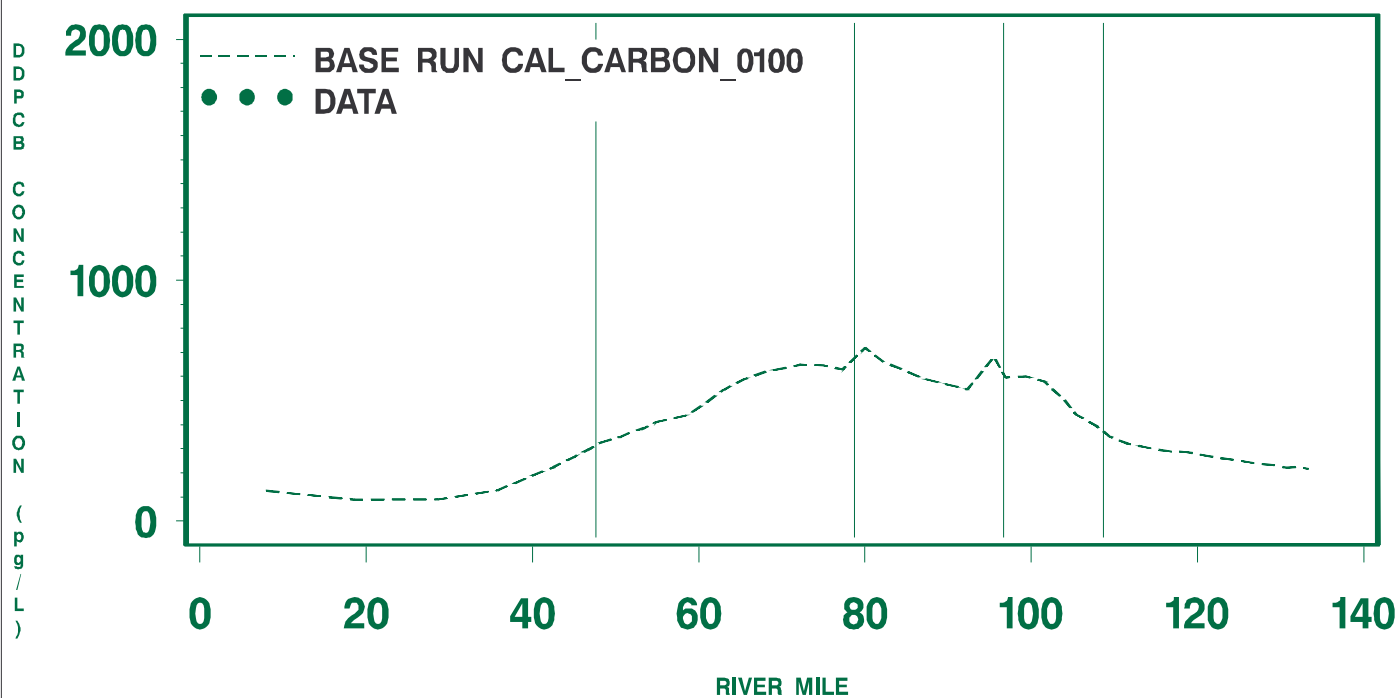
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CALIBRATION RUN ON DDPCB - WC DDPCB ON 11-21-02



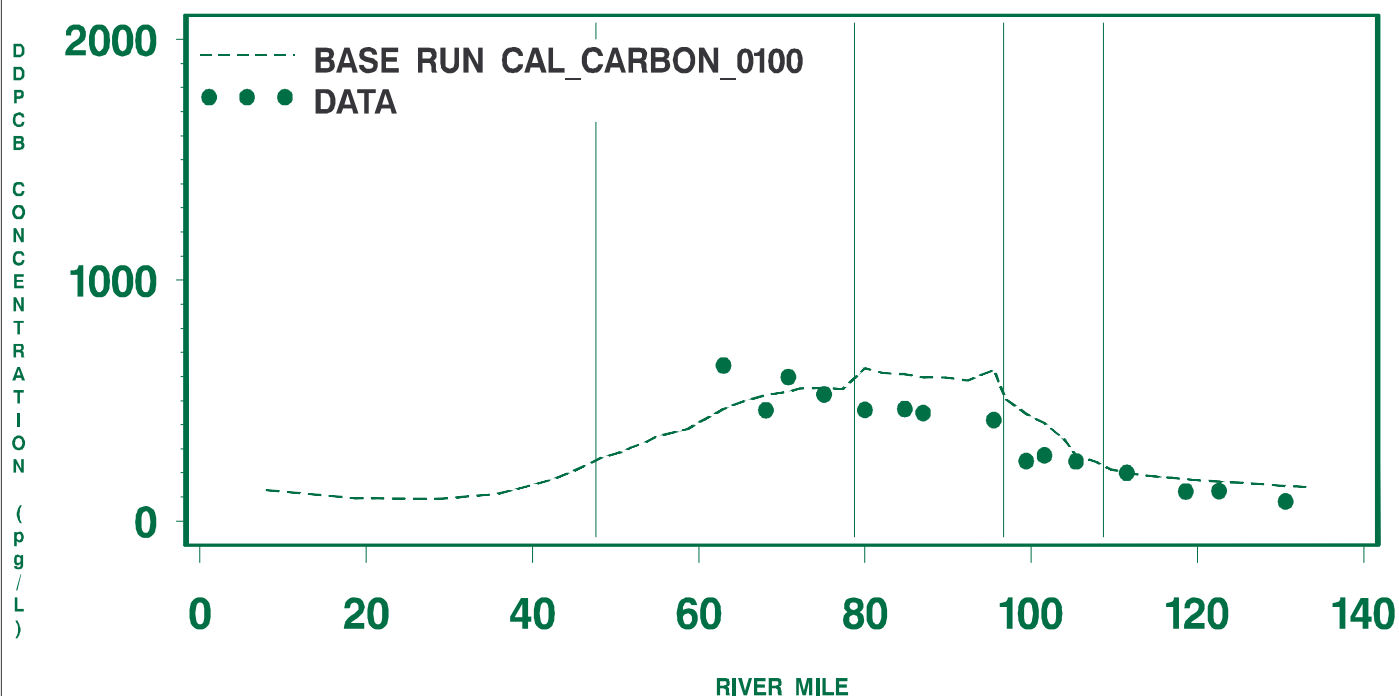
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31JUL03 18:51; FILE NUMBER CAL\_CARON\_0100

CALIBRATION RUN ON DDPCB - WC DDPCB ON 3-10-03



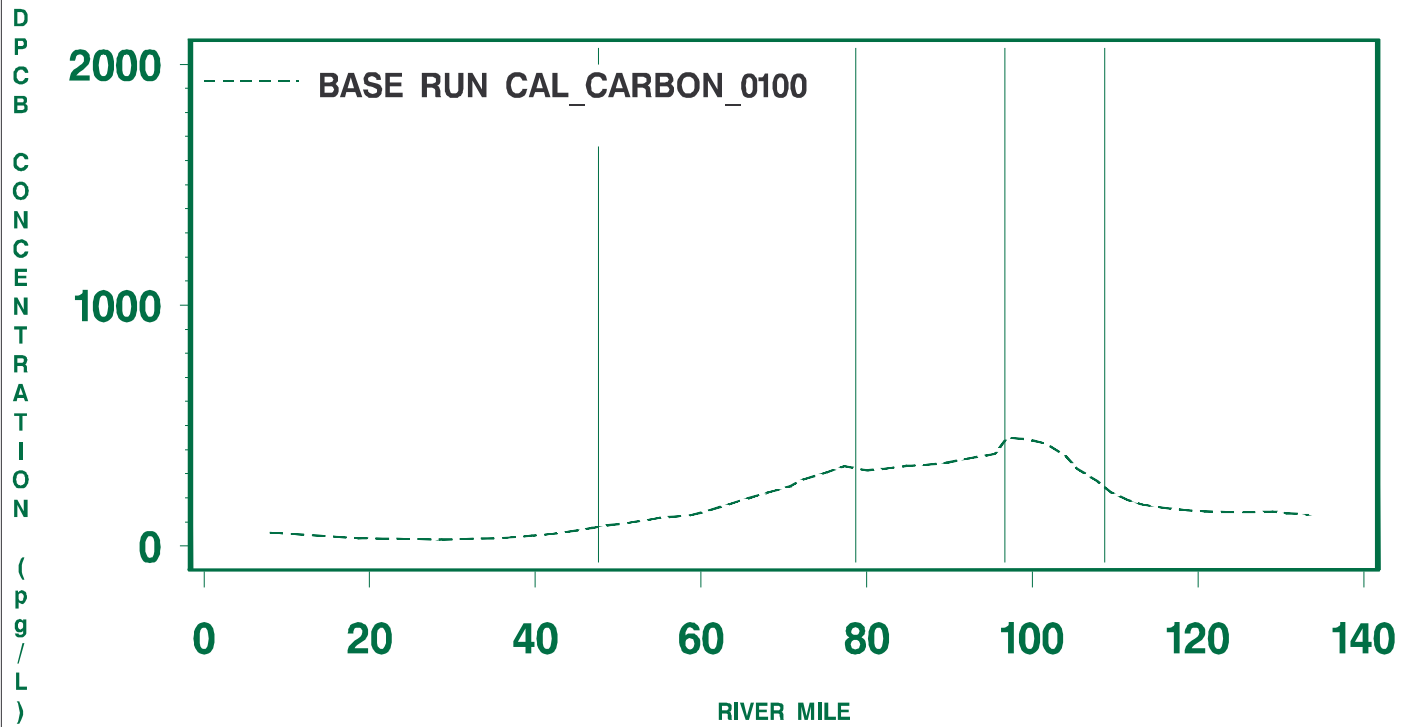
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31JUL03 18:51; FILE NUMBER CAL\_CARBOON\_0100

CALIBRATION RUN ON DDPCB - WC DDPCB ON 3-19-03



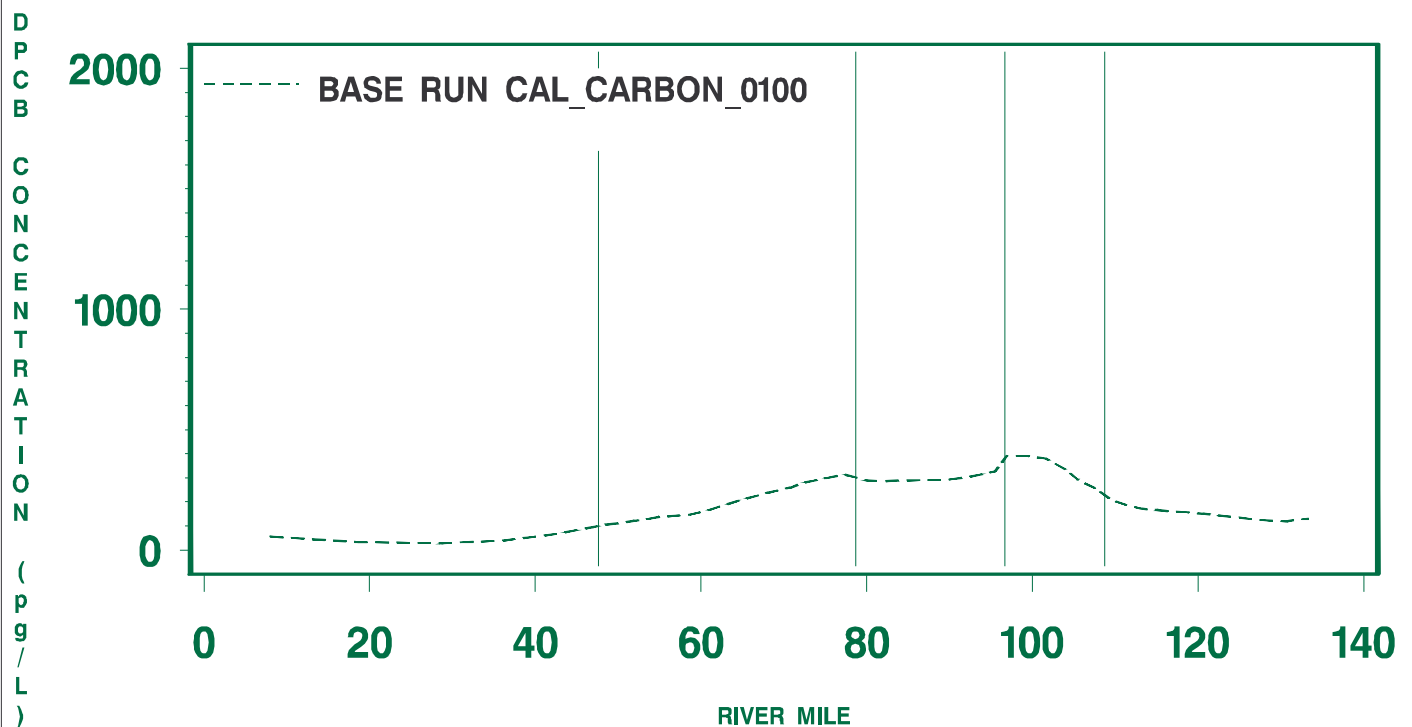
DDPCB= TRUE DISSOLVED + DOC-BOUND PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBOON\_0100

CALIBRATION RUN ON DPCB - WC DPCB ON 3-15-02



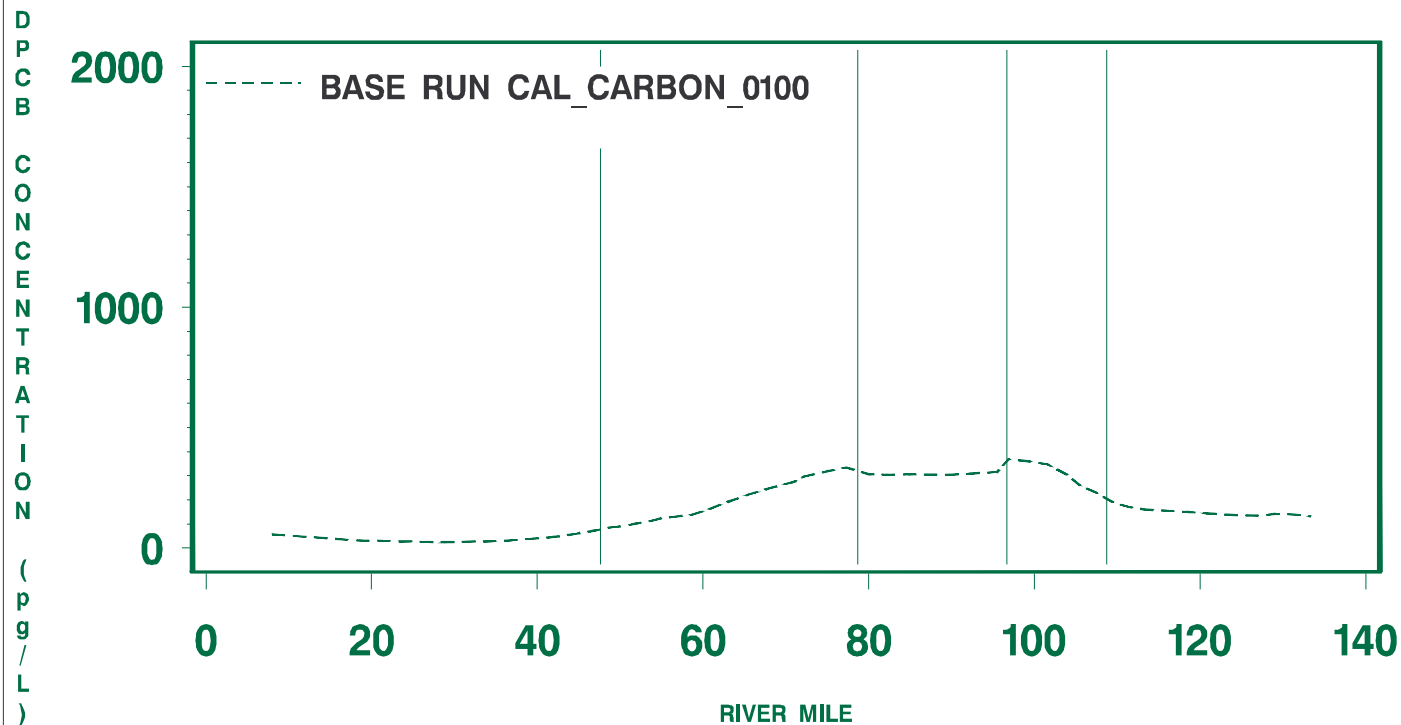
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31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON DPCB - WC DPCB ON 4-11-02



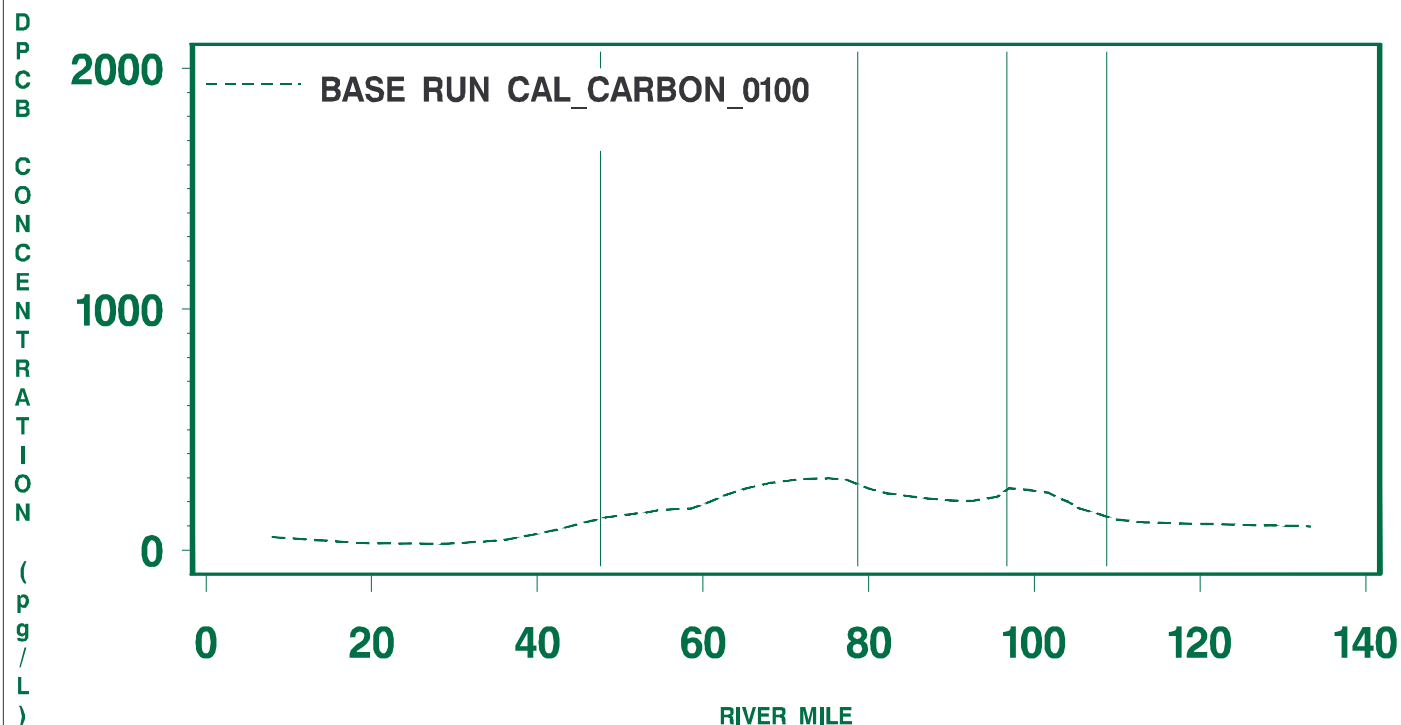
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CALIBRATION RUN ON DPCB - WC DPCB ON 4-22-02



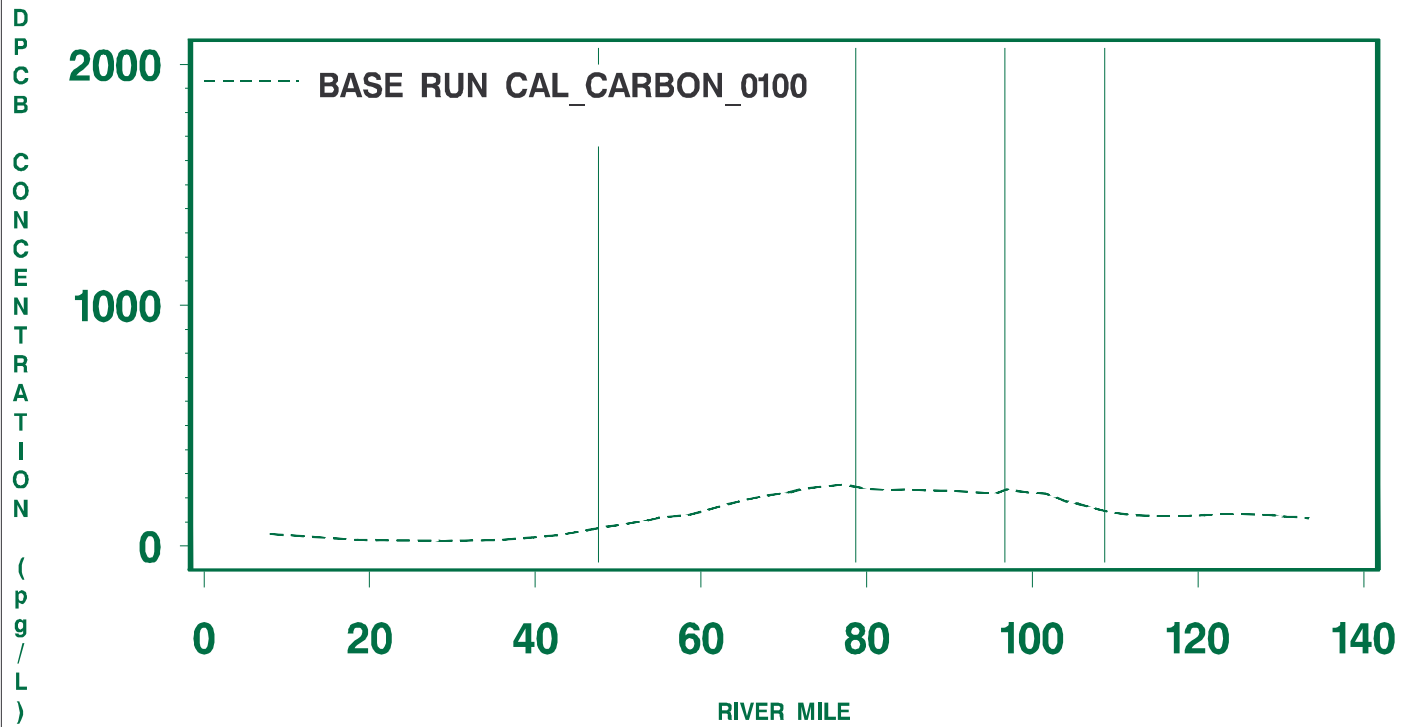
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CALIBRATION RUN ON DPCB - WC DPCB ON 5-06-02



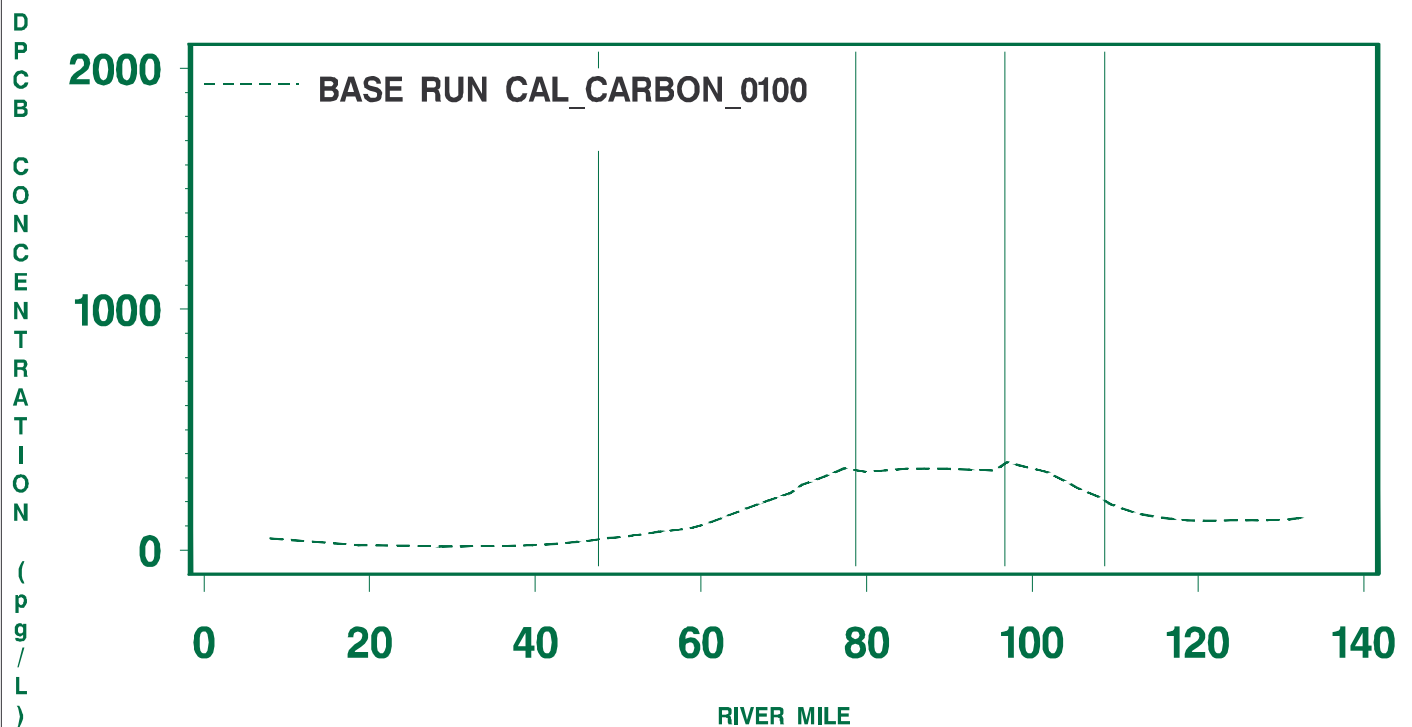
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CALIBRATION RUN ON DPCB - WC DPCB ON 6-19-02



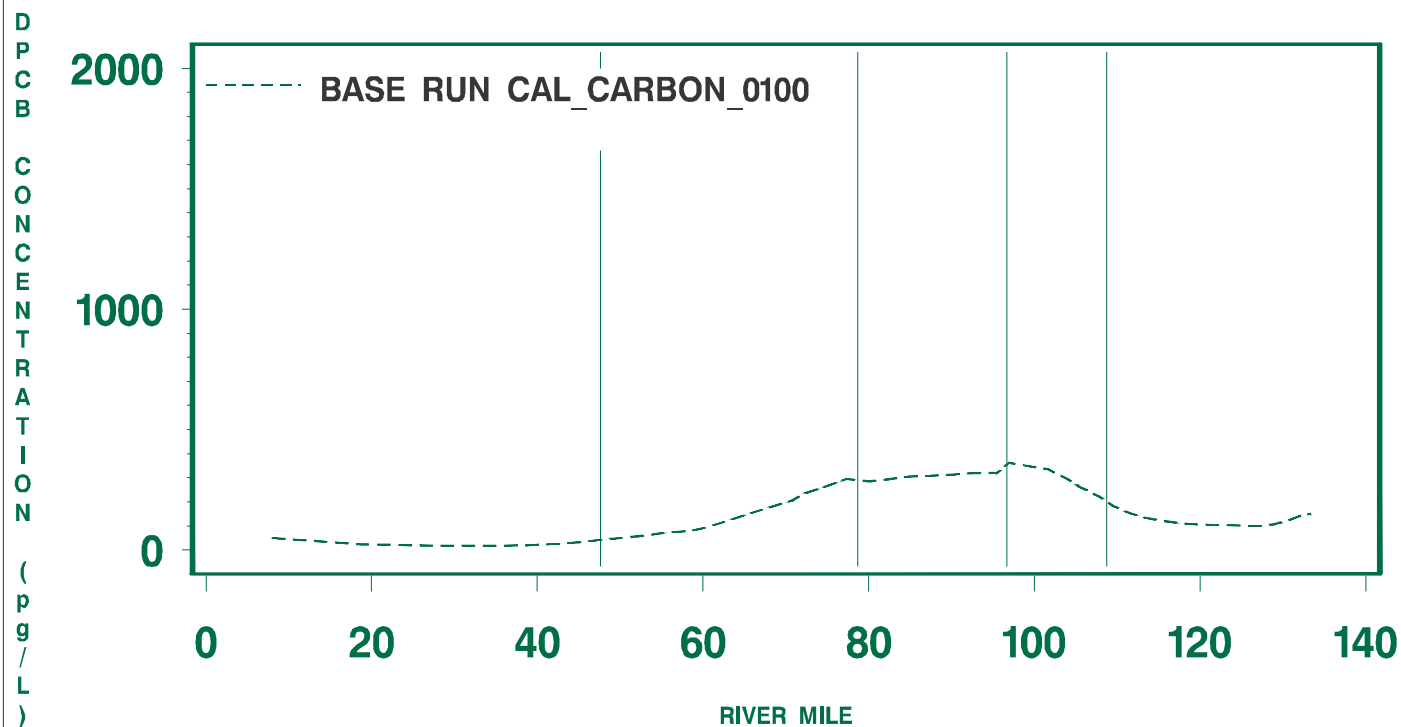
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CALIBRATION RUN ON DPCB - WC DPCB ON 08-05-02



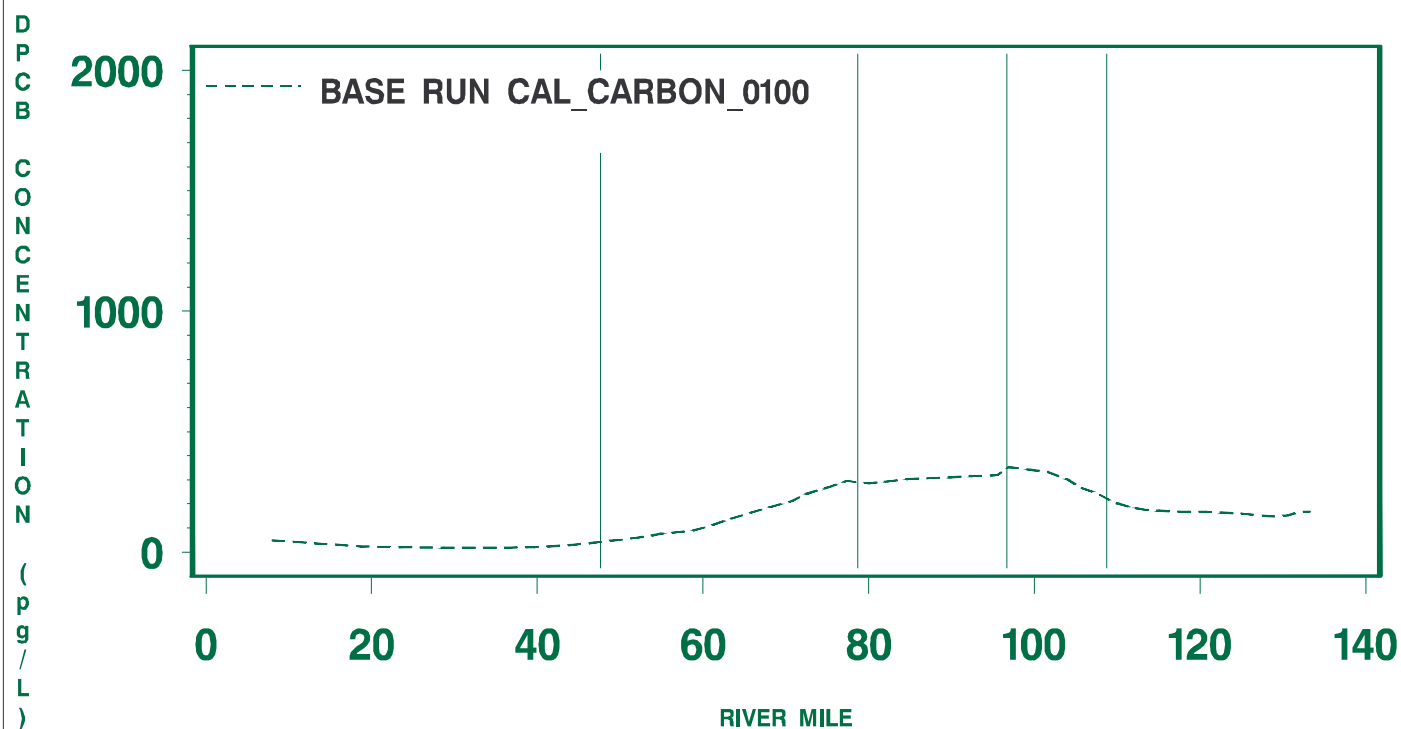
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CALIBRATION RUN ON DPCB - WC DPCB ON 08-19-02



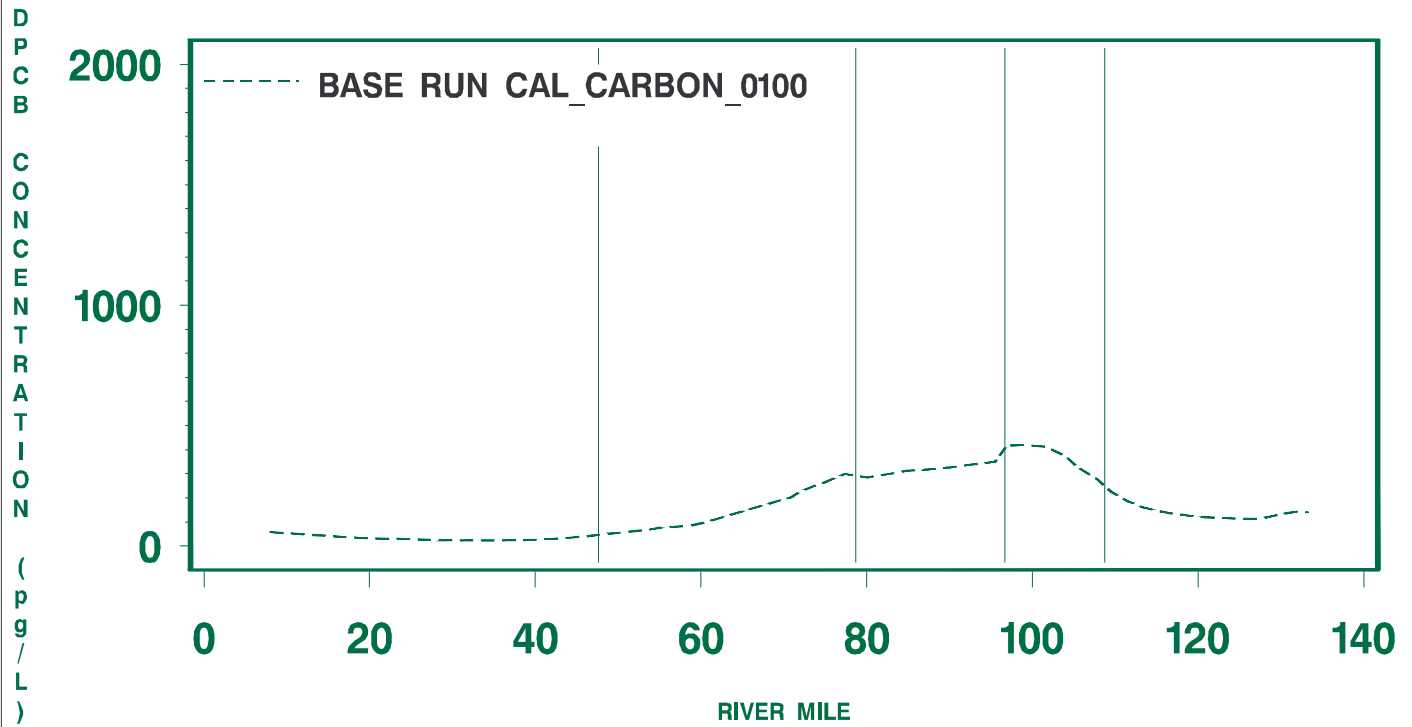
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CALIBRATION RUN ON DPCB - WC DPCB ON 09-03-02



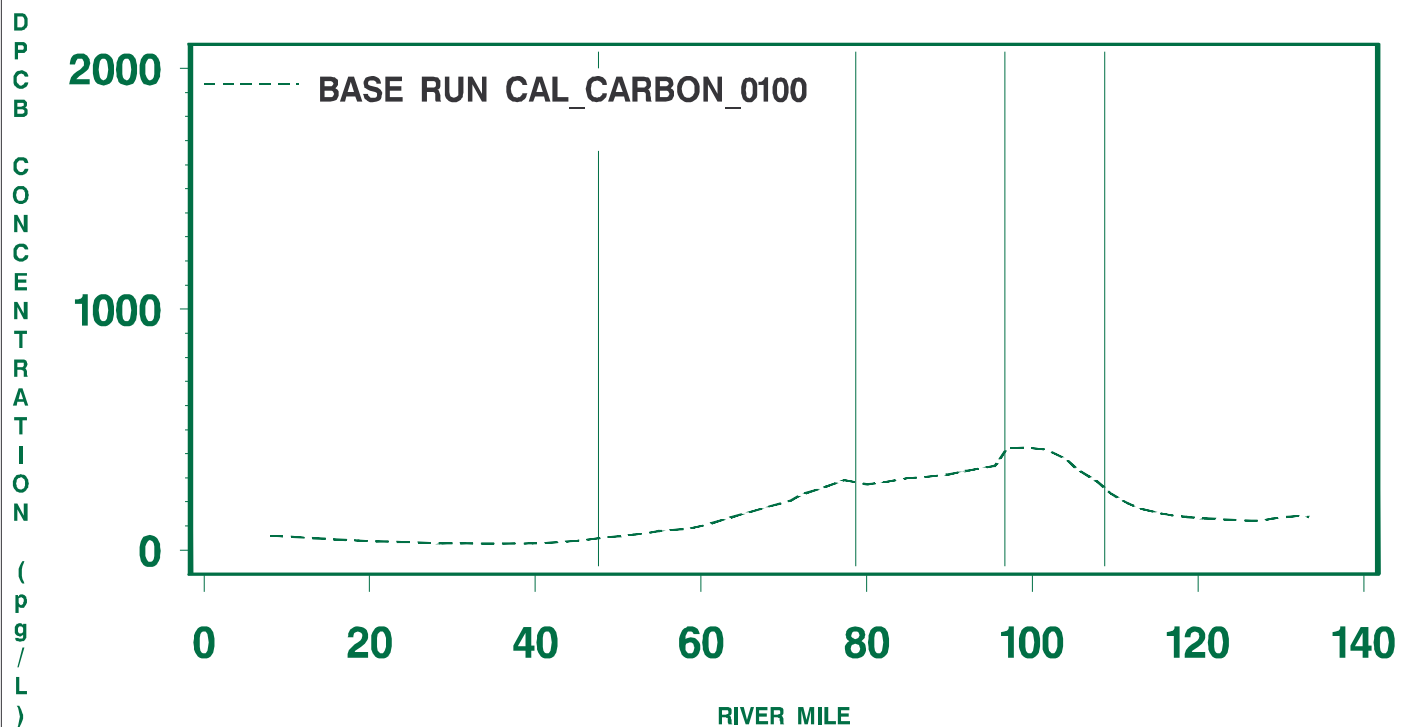
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CALIBRATION RUN ON DPCB - WC DPCB ON 09-23-02



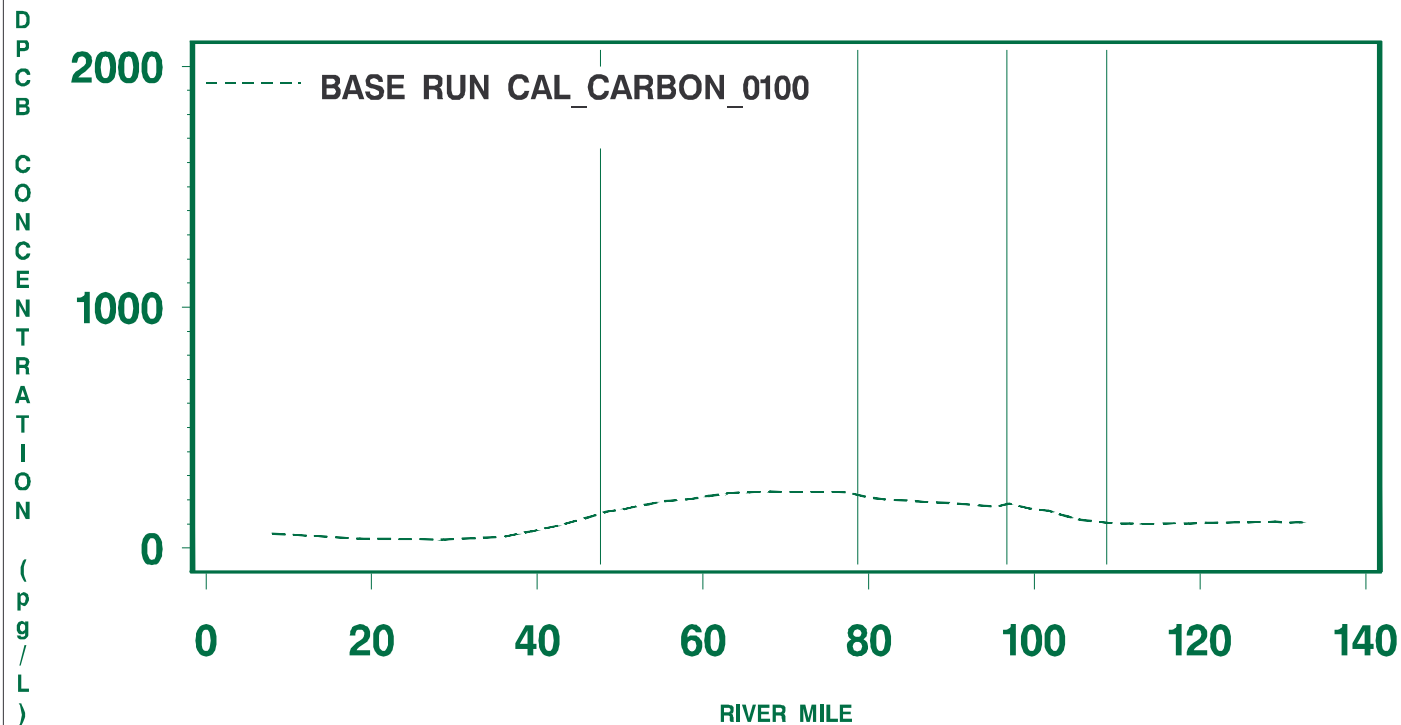
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CALIBRATION RUN ON DPCB - WC DPCB ON 10-08-02



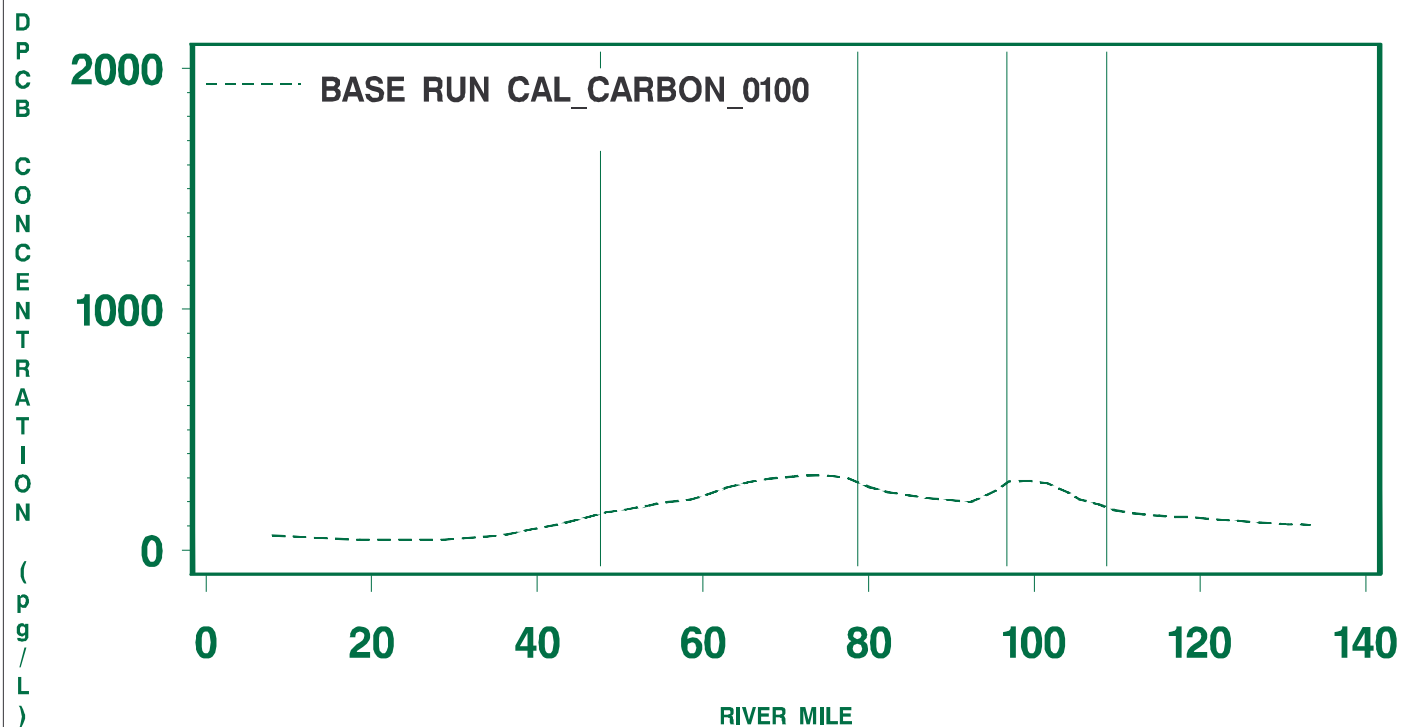
DPCB= TRUE DISSOLVED PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

CALIBRATION RUN ON DPCB - WC DPCB ON 11-21-02



DPCB= TRUE DISSOLVED PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100

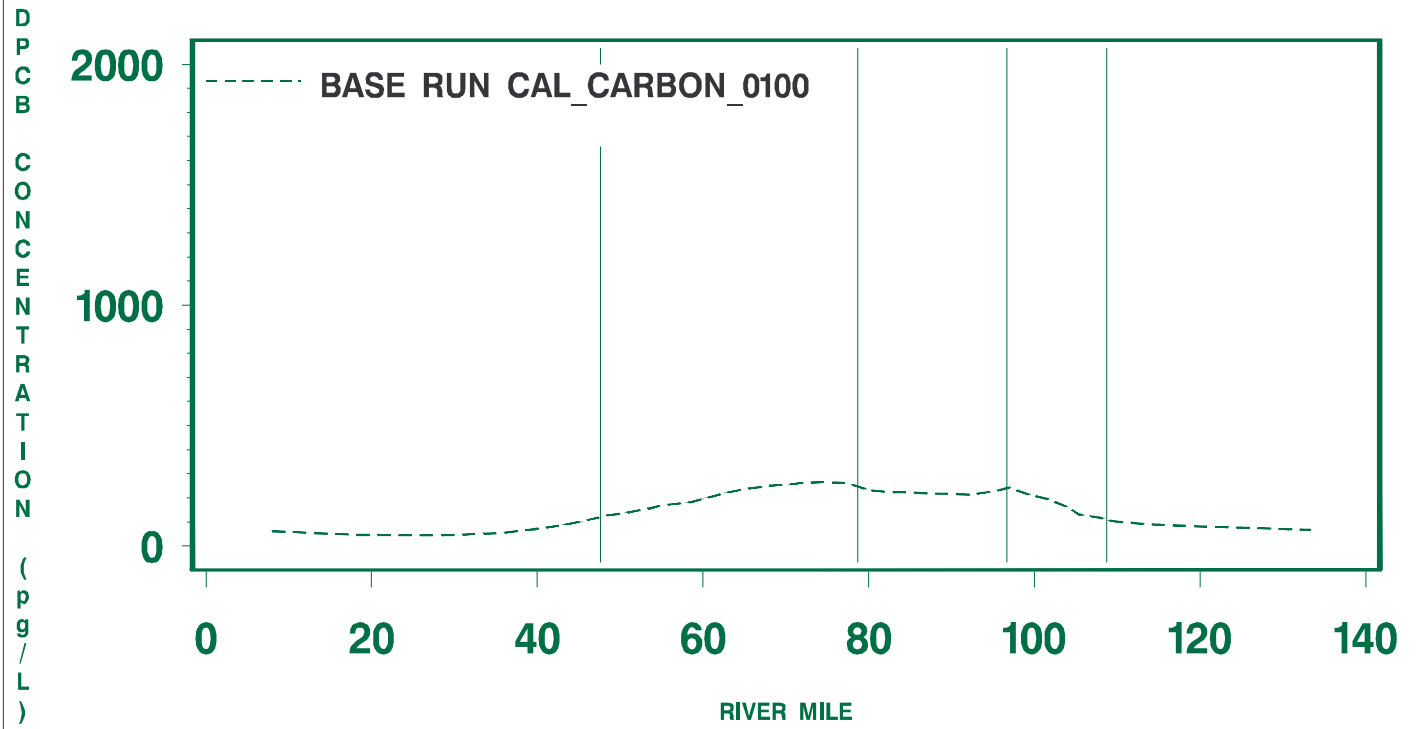
CALIBRATION RUN ON DPCB - WC DPCB ON 3-10-03



DPCB= TRUE DISSOLVED PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100



CALIBRATION RUN ON DPCB - WC DPCB ON 3-19-03



DPCB= TRUE DISSOLVED PENTA PCB  
31JUL03 18:51; FILE NUMBER CAL\_CARBON\_0100